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Practical Therapeutics

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ORIGINAL COMMUNICATIONS.

TREATMENT OF INFLUENZA.[1]

BY M. HOWARD FUSSELL, M.D.,

Professor of Applied Therapeutics in the University of Pennsylvania, Philadelphia.

There is no specific treatment, either drug, vaccine, or serum, for influenza. The patient should be immediately put to bed in a well-ventilated room, isolated from the other members of the household; should be given an abundance of water, and ten grains of potassium citrate every three hours.

If there is much headache and muscular pain, a capsule containing three grains each of Dover's powder, phenyl salicylate and acetphenetidin may be given every three hours. This powder may be continued two days.

The rest, water and citrate of potash should be continued until the temperature is continuously normal for three or four days.

If these directions were followed in every case of respiratory infection, the spread of these infections would be largely controlled, and the death-dealing complications of influenza before which we all stand so helpless would be few and far between. It is these complications which cause the layman, and indeed physicians in general, to view with actual terror the possible reappearance of an epidemic resembling that of September, October, and November, 1918.

The wisdom may be questioned of giving these patients salol and phenacetine. In the small doses I have suggested they are harmless if not continued long; they give much relief to the symptoms.

I have made this statement in the beginning rather than in the body of this paper, because however great the value of other prophylactic measures against the spread of disease, the spread is rapid, general, and devastating. The best prophylactic means against the fatal consequences of the disease, and a valuable one as a control, are those I have stated.

The laity should be taught this—indeed, during the past four or five weeks the newspapers have brought out in full force (I hope instigated by our Health Department) the fact that rest, fresh air and an abundance of water are far superior to any other means we have for controlling the ravages of respiratory infections.

Unquestionably the disease is spread through discharges from the nose and throat. Anything which prevents that discharge from being disseminated must be of value.

The greatest enemies to pathologic organisms are sunlight and fresh air. Teach the laity and practice ourselves that our living rooms and sleeping room should be ventilated and have light. Crowding into a small room with windows closed certainly spreads the disease from the ill to the healthy.

Unquestionably large assemblages are potent means of dissemination of the dis-

[1]Read before the Philadelphia County Medical Society.

ease. The health authorities have not forbidden the use of theaters and churches this winter, doubtless because of the comparative mildness of the epidemic, and because, under the circumstances, to do so would do more harm than good, because of the lowering of the morale of the community.

Quarantine of institutions has been productive in holding the disease in check. Isolation of the sick on the first indication of the disease has certainly limited its spread in the institutions so handled.

Our hands are about as dirty a portion of our bodies as there is. Not only are they soiled by street dirt, but are contaminated constantly with discharges from our mouth and nose. This discharge is thus conveyed to any article we touch, and is abundant cause for dissemination of respiratory infections. We are each of us I suppose constantly soiling our hands with spit, and discharge from our noses.

If a case of smallpox appears in a community such as Philadelphia, at once a whole square is quarantined, and every individual vaccinated against smallpox. This is as it should be.

Thousands of individuals cough or sneeze in our faces; other thousands soil handrails, food and utensils used by others. Other thousands transmit the disease through soiled handkerchiefs.

What is the answer?

Education, clean hands, paper handkerchiefs.

Spitting is being controlled. Dirty hands, dirty handkerchiefs, dirty gloves can and will be controlled by forever keeping at education, and adding example to precept.

We all know that infectious colds go through a household, from that household to another, and so on. Each infectious cold so spread is potent as a factor in the spread of pneumonia and influenza. We must stop it somehow. It is a large question, but can and will be forced home by education.

Theoretically, certainly, masks should be a valuable means to prevent the disease from being spread by close contact. A piece of sterile gauze tied lightly across nose and mouth is of great value, especially noticed in the hospitals in which Colonel Edward Martin officiated during the war. The sick individual should be masked as well as those in attendance. The ordinary way in which a mask is used, part of the time—sometimes hanging about the neck, sometimes over the nose and mouth—is worse than useless.

The remarkable results in typhoid-fever prevention by vaccination, and of vaccination against smallpox, of course raise the hopes for a specific prophylaxis and treatment of all who have to do with respiratory diseases.

Unfortunately, it is yet to be proven *what* the real infective agent of the disease influenza is. Hence any attempt to use a vaccine as a specific prophylactic thus far produced is handicapped with the fatal fact that we are not sure the vaccine really contains the causative organism. If any one wishes to be bewildered, let him read all the articles written on influenza since the beginning of the epidemic.

During the last epidemic, Kolmer, White, Rosenow and others made, and are still making, perfectly proper non-commercial efforts to manufacture products which appear as a scientifically studied and properly applied prophylactic.

Kolmer has given me authority to say that so far his products have not been proven of value. Rosenow's last papers are extensive. The laboratory work has been accurately done, but to me is not convincing. His statistics come from many physicians, all of whom are busy, all of whom probably believe in the efficacy of vaccines. The total number of cases reported is over 400,000, almost half a million. Not more than nine months could have been used in reporting this great mass of material. Of course Rosenow's efforts were made with the best intentions, but 40,000 cases a month, over 1000 cases a day for twenty-four hours a day, is cer-

tainly a huge number of reports from which to expect accuracy.

According to his statistics, in a group of 93,470 persons, who were vaccinated three times, 87.9 persons contracted the disease per 1000 vaccinated, and 1.43 per thousand of those vaccinated died. Of 345,133 persons not vaccinated, 281.8 per thousand contracted influenza and 8.55 per thousand died.

Certainly a good showing, but as in all such statistics unconvincing.

He concludes his article (*Journal of American Medical Association*, Aug. 9, 1919) with this as part of his summary: "It appears from all the facts at hand that by the use of a properly prepared vaccine it is possible to rob influenza of some of its terrors."

McCoy, in the same journal, after what appears to be a most critical, non-biased view, states: "A specimen of the vaccine which was being used in Illinois (Rosenow's vaccine) was tried in California, under rigidly controlled conditions, without success. The disease did not appear in the institution where the test was made until eleven days after the last injection, but after the epidemic had swept through it the results revealed that 37 per cent of the vaccinated were attacked, against 27 per cent of the controls, while 4.5 per cent of the vaccinated population died, against 3.6 per cent of the non-vaccinated. These are differences too small to be significant. Tests made in other institutions gave similar results, though we need not take the time to consider the details here." He concludes: "The general impression gained from the *uncontrolled* use of vaccines is that they are of value in the prevention of influenza; but in *every case*, in which vaccines have been tried under perfectly controlled conditions, they have *failed* to *influence* in a definite manner either the morbidity or the mortality."

In a matter of such great import we must surely go very slowly in advising the use of these or any other vaccines against infectious colds. Since Rosenow's last paper, the United States Public Health Service have taken all lipovaccines out of the market.

The vaccines made of Types I, II, III of pneumococci, as tested out by Cecil and Austin, seem to be of real value, although even that is now being questioned.

I am aware of the antagonism which my opinions on this particular point may arouse, and they are stated with the full knowledge of the fact that many conscientious physicians are using them with the best intentions.

What are these vaccines?

To quote from an advertisement in the *Philadelphia Roster:* "The experience of physicians who have used (a particular vaccine) in industrial institutions and private practice has confirmed their belief in its efficiency, both as a prophylactic and therapeutic agent."

"The formula (this particular vaccine) has been maintained unchanged since its introduction in 1910, but in the meantime, particularly during the influenza epidemic of 1918, new strains of bacteria have been added, thus increasing its polyvalency and efficiency. These bacteria include:

Influenza bacillus (Pfeiffer).
Streptococcus (hemolytic and viridans).
Staphylococcus (aureus and albus).
Pneumococcus (Types I, II, III, IV).
Micrococcus catarrhalis.
Bacillus Friedlander.

"As immunity is only relative, there is an advantage in 4 injections, beginning with a small initial dose progressively increased, thus affording a more complete and lasting immunity."

Now let us analyze.

They are biologic products which are composed of various organisms, none of which have been proven a cause of the disease influenza, or of the various infectious colds.

Like many other commercialized substances, warranted to be of use, they have not been found of value. I know of many statements on the part of physicians indicating that they think their use is of value.

I am unaware of any actual statistical proof that they are of value.

The *Journal of the American Medical Association* of January 22, 1918, has this to say:

"The 'mixed' vaccines which are discussed in the reports that follow were considered by the Council during the past year because inquiries had been received in regard to them.

"In publishing these reports it is desirable that the attitude of the Council toward 'mixed' vaccines again be stated. In view of the rapid development of bacterial therapy, the possibility for harm that attends the use of bacterial vaccines, and the skepticism among experienced clinicians as to the value of vaccines representing a combination of organisms, the Council has felt that it should scrutinize the claims for such agents with exceptional care, and that there should be admitted to New and Non-Official Remedies only those vaccine mixtures for which there is acceptable evidence to indicate that the use of the particular mixture is rational.

"In considering the subject the Council has borne in mind the fact that in many institutions in which cases are studied and the results of therapeutic measures carefully observed and controlled, vaccines of any sort are practically never used—certainly here the stock mixed vaccine has no recognition. Experienced clinicians have generally come to the conclusion that mixed vaccines have no specific action and that any effect they may produce is due to non-specific protein reaction.

"As set forth in the reports, in no case was the evidence submitted by the proprietors sufficient to establish the claims made for the preparation. Hence none was accepted for New and Non-Official Remedies.

"The preparations which form the basis for the accompanying reports are only a few of the many that are being made and sold by some biological houses. Doubtless many of those not dealt with in this report are equally irrational and sold under claims equally or probably even more unwarranted than those with which the present report deals."

I believe that they are at least negatively harmful in that one, being "protected" by a vaccination against influenza, thereby is led to neglect measures of known value. I believe when used in large doses they are actively harmful, and are certainly so when used intravenously.

I believe the acceptance of such an advertisement in a publication which bears the imprint of this Society is a mistake. I have protested and been told it will be taken under further advisement.

So far as I know there are no observations or attempted observations to show that the commercial vaccine against influenza has the least effect in the formation of immune bodies.

Influenza pneumonia, characterized by consolidation of the lungs more or less complete, with dulness over the parts, or indeed the whole of both lungs, with breath sounds blowing or distant, with the whole chest full of bubbling râles; cyanosis, rapid breathing, and, until almost complete dissolution, a curiously good pulse—in this condition treatment is almost a hopeless task.

Of course we must try. If the case has high fever and exhaustion is great, enteroclysis by the Murphy method of 25 per cent glucose or an alkaline solution seems of value. Digitalis, 15 drops every three hours, and atropine hypodermically also appear to relieve the symptoms.

Oxygen seems occasionally, but by no means always, to give relief and to lessen cyanosis.

It is in this class of cases, so hopeless, that I have seen immune serum, enthusiastically suggested, to be of value. Certainly in two cases of my own in which life was seriously threatened the patients had immediate relief after its use.

Laryngitis, which is a serious and annoying complication, may be best treated by keeping the patients in a room well ventilated but free from drafts, and giving them

inhalations of steam impregnated with benzoin.

If the lung complication is a lobar pneumonia and the organism is Type I, Type I serum is of value. I do not believe it is good practice to give polyvalent serum without knowing that at least Type I is present as an infecting agent, because the degree of protein reaction is often severe and may turn the scale toward dissolution, and because there is no specific value unless Type I is present.

Empyema is frequently difficult to diagnose, often being sacculated or interlobar. The free use of the exploratory needle, and when practicable *x*-ray, is of the greatest help. The treatment is purely surgical.

The rapid, feeble heart, the occasional attacks of bradycardia, mark a severe long-continued effect on the heart muscle or its nervous mechanism. Great care should be taken in the convalescence to guard against overstrain, and to insist on a long period of rest.

In a word, then—avoidance of crowds, careful living in well-ventilated rooms or in fresh air, avoidance of commercial vaccines.

Immediate rest, water, fresh air, and perhaps alkaline treatment in general, will give the best results.

PRENATAL CARE FROM THE VIEW-POINT OF THE OBSTETRICIAN.[1]

BY EDWARD P. DAVIS, M.D.,
Professor of Obstetrics in the Jefferson Medical College of Philadelphia.

The obstetric rule that the interests of the mother come first and those of the child second applies in the consideration of this subject. The obstetrician is primarily interested in preserving the life and health of the mother during pregnancy, realizing that by so doing he is also safeguarding the interests of the child.

This subject is an illustration of the familiar fact that there is nothing in medicine absolutely new. Records recently found in Babylonian ruins show that prenatal care and the care of the pregnant woman were known at the earliest times. It is of considerable interest to trace the fortunes and characteristics of the descendants of Cain, the first child, and to reflect that his violent temper may have been caused by prenatal maternal conditions; and it is also of medical interest to know that during her first pregnancy Eve suffered from disorders of digestion and that her insatiate desire for apples was largely the result of an effort on her part, by the use of this efficient fruit, to remedy chronic constipation.

The function of the obstetrician is, first, to save life and then to preserve health. During pregnancy obstetric surgery is called upon to deal with hemorrhage. With the exception of a few cases of serious accident and injury this hemorrhage arises from an abnormal attachment of the ovum. We recognize in ectopic pregnancy and in placenta previa the necessity for obstetrical surgical help. So in accidental separation of a normally implanted placenta prompt and skilful action upon the part of the obstetrician and a well-timed and properly performed operation may save the lives of mother and child. In the event of serious injury through accident or intentionally inflicted wounds the obstetrician must again have prompt resort to surgical procedure.

It is, however, in the great pathological entity known as the toxemia of pregnancy that the care of the mother during gestation is especially important. Whatever view may be adopted concerning the cause of this condition, and however successful may be obstetric treatment in emergencies and in cases which develop suddenly, it is a familiar fact that the majority of these cases can be prevented by proper care during pregnancy. More than a report by

[1]Read before the joint meeting of the Philadelphia Obstetrical Society and the Babies' Welfare Association, January 8, 1920.

telephone or a cursory examination of the urine is necessary for this purpose. A physical examination at regular intervals, including pulse tension, the examination of the heart and circulation, a thorough examination of the urine and often of the blood, are all required. Patients differ so greatly that no routine directions concerning hygiene can be thoroughly efficient. Each case must be studied in accordance with the needs of the individual and often in view of her circumstances. So striking are the good results obtained by hospital care when a serious condition threatens that obstetricians should urge their patients to come to hospitals for various times as their needs indicate. A month under hospital care in the early portion of a pregnancy, or before the confinement, will often be of the greatest value.

This subject has a broad scope and includes economic factors as well. A pure food and water supply, the care of women working in shops and factories, proper warmth in winter and escape from excessive heat in summer are all important factors. The question of the control of patients to avoid toxemia is far more difficult than the treatment required. It is so difficult to convince them that caution is necessary when they are not actively ill that the physician may fail in his best endeavors. Additional hospital space is needed so that pregnant patients can be in separate wards, where they are not annoyed or frightened by cases of confinement or by infants, and where the best hygienic surroundings can be procured. For those who cannot go to hospital, visiting nurses, social workers, and the aid which a good municipal government can give its citizens are greatly to be desired. Unquestionably to-day these processes of various kinds, including eclampsia, which may be grouped under the head of toxemia of pregnancy, furnish the greatest danger and that most difficult to control of any of the complications of pregnancy. No one but the obstetrician is competent to judge when a pregnancy must be ended to save the mother's life. One must remember in these cases that not only is maternal life, but maternal future health, at stake, and a woman on the verge of eclampsia, if neglected, may recover from her confinement with chronic nephritis.

Of very considerable importance for both mother and child is the occurrence of tubercular infection, usually pulmonary, in child-bearing women. While medical treatment may do much obstetric knowledge and experience are necessary to determine whether pregnancy should be interrupted in the interests of the mother and how the interests of both mother and child can best be guarded. We need further knowledge concerning the propriety of maternal nursing in these cases, and what means should be taken to avoid the infection of the fetus if it is born apparently sound. The epidemic of influenza was recent enough to be still fresh in our minds. We recognize the fact that some of these cases occurring in pregnant women were hopeless from the beginning, but many that were seen promptly, put immediately to bed, and carefully looked after escaped bronchial pneumonia; pregnancy was not interrupted, and mother and child did well. The avoidance of infection by pregnant women in the presence of such an epidemic is of the utmost importance. While so far this winter influenza has not become epidemic, we are seeing cases of bronchopneumonia among pregnant women. We recognize the fact that the nasal and often the pharyngeal mucous membranes are congested in the majority of cases of pregnancy. Nasal and pharyngeal catarrh and irritation are very common. When bronchopneumonia is prevalent any abnormality in the nasal and pharyngeal mucous membranes in the pregnant woman should receive prompt attention. Care should be taken to avoid crowds, infected vehicles and infected persons in so far as possible, and much can be done to protect the pregnant woman and her child from this grave danger.

Septic foci developing during pregnancy shorten the lives of mother and infant. The colon bacillus, whether causing appendicitis, cholecystitis, or pyelitis, is a frequent menace; while the appendix should be removed during pregnancy so soon as

the diagnosis of appendicitis can be made, in cholecystitis and pyelitis surgical interference during pregnancy is rarely necessary, but care and attention to these conditions are exceedingly important. Here again hospital treatment is necessary.

Syphilis and gonorrhea complicating pregnancy demand hospital care. While apparently they are not grave dangers among the well-to-do, yet in the aggregate they are a serious menace to the lives and health of the mother and child. Modern methods of treatment are so successful when applied in the hospital and thoroughly carried out that there can be no excuse for neglect of these patients.

A condition of complexity, in which our knowledge is as yet rudimentary, may seriously shorten the health of the mother and the life of her offspring. With regard to those abnormalities in the action of the ductless glands whereby the balance of metabolism in mother and fetus is seriously disturbed, we know little, except in the case of disease of the thyroid gland; but there is sufficient evidence to show that this is a condition of real danger and that much can be done if the patient is under accurate observation and thorough methodical treatment. These are among the most difficult and among the most interesting cases coming to the attention of the obstetrician.

The writer may be pardoned a brief illustration: An apparently healthy and vigorous woman married a man of average health and development, and gave birth after her first pregnancy to an exceptionally active and vigorous child. In both the families of husband and wife healthy and vigorous children have been born, and no case of congenital disease or malformation has been recorded. The second pregnancy of this patient terminated in the stillbirth of a large and well-developed child. The definite cause of this stillbirth could not be ascertained, as a complete examination of the fetal body was not made. During the third pregnancy the patient was for some time under the observation of the writer. The general condition of the mother was good; the urine, including a nitrogen partition, showed no great abnormality; pulse tension remained normal; digestion and assimilation and appetite were normal. In the ninth month the mother developed a rapid enlargement of the abdomen; heart sounds were heard less plainly. Pregnancy was at once terminated by the induction of labor. A large male child was born in breech presentation, followed by the birth of a large, thick and somewhat pale placenta. The child breathed feebly, its respiration apparently being embarrassed by abdominal dropsy. With the hope of securing some improvement, the abdomen of the fetus was immediately opened, when abundant serum escaped, and it was observed that the liver was considerably enlarged. There was dropsy in other portions of the body, and the child soon perished. Three months have been occupied in the study of the body of this infant and its placenta. Bacteriological examination by culture was entirely negative. Both father and mother gave decided negative results to the Wassermann test. A prolonged and thorough search for the spirochætae of syphilis has been negative. The spleen showed congestion, the kidneys an unusual degree of fetal lobulation. The liver showed cellular degeneration, almost complete absence of ducts, and an abundance of mononuclear cells believed to be largely endothelial leucocytes. The skeleton showed no evidence of syphilis or other essential disease. The placenta and cord were searched with great care for spirochætæ, with a negative result. There was abnormal development of syncytium in the placenta and some areas of fibrosis. It is impossible to make a diagnosis of syphilis in the case, and yet the infant perished from a profoundly toxic condition whose most evident lesion was found in the liver. The parents are desirous of obtaining another living and healthy child. The mother has made an uninterrupted recovery from her pregnancy and confinement and is in good general condition. There is a retroversion of the uterus, which can be corrected without essential difficulty. Can we hope in the event of future pregnancy to give to the mother thyroid and

other extracts and thus secure a successful issue?

There is evidently in this field of obstetric pathology a need for minute and thorough study in biological and pathological chemistry. Research upon patients in hospital where they can be controlled and where accurate investigations can be carried out offers the only prospect of success.

The recent war has given opportunities to obtain valuable knowledge in the care of pregnant women working in factories. There is considerable data available in English and French literature going to show that under good care the pregnant woman can do considerable muscular work even indoors, if under proper conditions, without injury. While the need for such supervision may not be so great as in wartime, still the subject demands intelligent study and the coöperation of medical, civic, State, and national authorities.

The question of the maintenance of a healthy population and the checking of the declining birth-rate is very large and very important. The action taken by France in the first years of the war, whereby the government took definite steps to safeguard pregnant women, to support, maintain, and care for them, is worthy of imitation. England has recently been aroused to a thorough study of the subject because of the declining birth-rate. In other European countries there is still greater need. In our own country there can be no better way of allaying industrial unrest than by providing the best possible sanitation for the families of artisans. A healthy family and a peaceful home are an excellent antidote to bolshevism. The rural nurse, the village nurse, the visiting nurse of the city, the small hospital, good roads, strict regulation of midwives if such are permitted, and the general elevation of obstetric practice are all useful. All large manufacturing concerns realize the value of sanitation among employees and of taking some measures of care for the children of those who work for them. Economic conditions which encourage early marriage will do much to prevent criminal abortion and vice.

In the interests of the unborn child the prompt detection and treatment of syphilis is of especial importance. So the avoidance of alcohol must be of great benefit. So, too, whatever will enable the mother to resist the development of tubercular infection. The obstetrician is sometimes puzzled to know what can be done to these cases in which comparatively sudden increase in the size of the abdomen and the progressive diminution of the clearness and vigor of heart sounds indicate amniotic dropsy. If the child is viable the prompt induction of labor is indicated in the interest of the fetus. We are as yet in ignorance of any efficient means of preventing this condition. The coiling of the cord about the fetus may develop during pregnancy and threaten fetal death. Here the history of violent fetal movements followed by a diminution or cessation of abnormal sound heard, although faintly, in the cord may give warning to the obstetrician and lead him to deliver the patient as rapidly as is safe.

In general the question of the conduct of labor is of great importance in the interests of the fetus, and up to the moment of birth this may actually be a part of prenatal care. The interruption of pregnancy should always be considered a serious matter. In the interests of the fetus pelvic deformity is no longer a justifiable cause for the interruption of pregnancy. Delivery by surgical operation is sufficiently safe to enable the obstetrician to give the child a fair chance. Where pregnancy is unduly prolonged the interruption of labor is clearly indicated both in the interests of mother and child, unless the fitting of the fetus into the pelvis is so perfect that there can be no doubt of the possibility of safe vaginal delivery when the uterus is aroused to action. Even under these circumstances it must be remembered that in prolonged pregnancy the skeleton of the child may become so firm that birth pressure may be dangerous.

The decision to sacrifice embryonal or

fetal life in the interests of the mother is not to be lightly made. The obstetrician must be sure of his ground before taking this important step. If a fair chance be given to obstetric science this necessity cannot arise with great frequency.

From the view-point of the obstetrician prenatal care embodies many of the facts long known in obstetric science and tends to bring about results for which the obstetrician has long been desirous. He will gladly welcome the establishment of wards in maternities for this purpose, the employment of additional resident physicians and nurses, the use of the visiting nurse and social worker, and above all increased facility for laboratory research and the study of obstetric pathology. Good work done in prenatal care may help greatly to solve some of the most important problems which confront the obstetrician to-day.

In the interests of the public, good can be accomplished by spreading accurate information among women concerning those conditions which most gravely threaten mother and child in pregnancy. Whether this information be offered in carefully prepared articles published in popular journals or whether by notices placed in rooms frequented only by women experience may decide, but unquestionably in the interests of the nation the education of women in this regard will be of great value.

PRENATAL CARE FROM THE VIEW-POINT OF THE MEDICAL SCHOOL.

BY B. C. HIRST, M.D.,
Professor of Obstetrics in the Medical Department of the University of Pennsylvania.

Systematic instruction in this matter should be given as it always has been. It should be both theoretical and practical.

The student should be theoretically taught, but the time that should be devoted to it and the importance of it as viewed by some enthusiasts are much exaggerated. No more could be expected of this instruction than that it should reflect the practice of the best specialists. This comprises:

1. Taking histories.

2. The preliminary or first vaginal examination at the third month.

3. Advice as to the hygiene of pregnancy, including: Diet; the bowels; prudence about avoiding cold; bathing; physical exercises and exertion; marital relations; reporting at once unusual symptoms; and the care of the nipples.

4. Insistence on regular visits to the physician for the estimate of blood-pressure and weight once in two weeks.

5. Routine examinations of urine every two weeks, alternating with the visits to the physician.

6. The examination four weeks prior to labor, which includes pelvimetry, antepartum fetometry, palpation, and auscultation.

7. Weekly examinations of urine and estimates of blood-pressure in the last month, the two alternating so that the patient's condition is supervised twice a week.

The practical training must depend upon the clinical facilities of the department in a medical school.

In the University of Pennsylvania Maternity we have evolved the following system: Students of the third year serve a week as internes in the Maternity Hospital; during this time they take histories; the blood-pressures of waiting women; examine the urine; and receive demonstrations with opportunity for individual practice in pelvimetry, abdominal palpation, antepartum fetometry, and auscultation. They also have the privilege of attending the dispensary service and obtaining further practice on the ambulatory waiting patients.

In the fourth year there is ten days' residence in the out-patient department with a daily dispensary service, with opportunities to practice antepartum diagnoses both in the dispensary and in the patients' homes. Members of the third-year class

have an extra voluntary service of two weeks in the hospital, and those of the fourth year an extra two weeks voluntary service in the out-patient department. About half the members of each class avail themselves of this opportunity.

This instruction as outlined above is as much as can be expected in a scheme of undergraduate teaching and quite as much as this particular part of the course deserves. It shows the student the best method of conducting private practice, and makes him competent to give the proper advice and make the necessary examinations. There are two other items of antepartum investigation that must receive attention in hospital practice, though they are not often required in the better sort of private practice, namely, routine Wassermanns and vaginal smears. In these two matters also the student should and does receive instruction.

In advising pregnant women, an optimistic tone should be taken. They should not be threatened with all sorts of dire consequences if they do not report regularly, but should be assured that they will be kept in good health and safe if they obey directions.

The despondency of pregnancy should be remembered, and it is well to recollect the 13 cases of insanity in the pregnant wives of doctors reported by Fordyce Barker. It will be recalled that they lost their wits by reading their husbands' textbooks on obstetrics.

LOCAL ANESTHETICS.

BY HERBERT C. HAMILTON.

[From the Research Laboratory of Parke, Davis & Company, Detroit, Michigan.]

When a substitute for cocaine makes its appearance, the claims for its usefulness must be carefully examined and verified if possible by unprejudiced investigators.

Apothesine was introduced to the medical profession after being subjected to the most careful tests, including both laboratory tests on animals and clinical tests by competent physicians and surgeons.

These tests showed that apothesine, which was not only brought up but also born in America, is a true local anesthetic, about one-fifth as poisonous as cocaine, with no habit-forming effects, and with a potency fully equal to cocaine in some respects, although less effective in others.

Sollmann[1,2] in a series of tests of local anesthetics seemed to demonstrate that in every respect it is less effective than cocaine. For example, Sollmann found that for terminal anesthesia, tested by intracutaneous administration, cocaine is eight times as potent as apothesine.

Other tests were applied, but only this one seems of especial value.

Following this an article was published by Hamilton[3] showing his results obtained by applying three of the methods used by Sollmann. The results he obtained can be summarized as follows, cocaine being taken as of unit value:

	Cocaine.	Apothesine.
For nerve blocking.....	1	1
For terminal anesthesia.....	1	1
For mucous membrane anesthesia.....	1	1/3

Sollmann[4] objected to the data by the second method since it was at considerable variance with his. He reported cocaine to be eight times as potent as apothesine by this method.[2] That his report was based on considerable research is shown by Sollmann's statement:[4] "Before I tried apothesine I had made some 300 injections on myself, and the results were always quite definite."

No further published account of experiments to confirm his results has appeared under his name, but evidently such experiments were conducted,[5] since they were reported as follows by the Council of Pharmacy and Chemistry: "A further series of experiments were made by Sollmann to compare still further the results previously

reported by him and Hamilton." These "demonstrated in every case that the efficiency of apothesine is unmistakably lower than that of cocaine, being at best one-half." While this is greatly at variance with his first results—showing a potency four times as great as before—there is no reason to doubt the authenticity of the report. The discrepancy is in part accounted for by the further statement[5] that there is "considerable variation in the susceptibility of different skin areas, especially to apothesine." The difference in susceptibility of different skin areas is a fact well known to the merest student in physiology. It is therefore surprising to note this admission from Sollmann.

In carrying out tests of local anesthetics by this method certain conditions should be observed to avoid error.

The injections must all be really intracutaneous. If the skin does not come up in each case in a typical raised wheal it is not a proper injection.

The injections should be made on another person and not on oneself. The reason for this is obvious, because the end point of the test is a finely drawn conclusion and must not be influenced by any knowledge which might be prejudiced.

The injections should not amount to more than 0.2 Cc.; the solution should be in physiological salt solution without preservative; it is preferable to test only one sample along with the standard at one time; the injections should be not more than one inch apart and preferably on the upper side of the forearm. There should be a fair agreement on tests on not fewer than three subjects; the subjects should be in complete ignorance of the identity and degree of dilution of samples injected.

Observing these precautions I have corroborated my first results,[3] the injections being made by Dr. N. S. Ferry into three subjects.

As before, the tests for degree of anesthesia were made by pricking the skin over the site of the injection with a sharp needle, and where the degrees of anesthesia from two injections were unlike I have indicated this difference by numbers of + signs.

Along with the test of apothesine is included a preliminary test of an experimental product included to show the data on a product less active than cocaine.

SUBJECT—H. C. H.		
A—Cocaine	1:2000	+ + + +
B—Apothesine	1:2000	+ + + +
C—Experimental	1:2000	+ + +
A—Cocaine	1:3000	+ + + +
B—Apothesine	1:3000	+ + + +
C—Experimental	1:3000	+ +
Right Arm.		
A—Cocaine	1:4000	+ + +
B—Apothesine	1:4000	+ + + +
C—Experimental	1:2000	+ +
Left Arm.		
A—Cocaine	1:4000	+ + + +
B—Apothesine	1:4000	+ + +
C—Experimental	1:2000	+ +
SUBJECT—DR. L.		
A—Cocaine	1:3000	+ + + +
B—Apothesine	1:3000	+ + + +
C—Experimental	1:3000	+ + +
A—Cocaine	1:4000	+ + + +
B—Apothesine	1:4000	+ + + +
C—Experimental	1:2000	+ +
MISS B.		
A—Cocaine	1:3000	+ + + +
B—Apothesine	1:3000	+ + + +
Right Arm.		
A—Cocaine	1:4000	+ + + +
B—Apothesine	1:4000	+ + + +
Left Arm.		
A—Cocaine	1:4000	+ + + +
B—Apothesine	1:4000	+ + + +

In the data on Miss B. the results were complicated somewhat more than in other cases by observing a difference between the two compounds in the promptness of anesthesia and the duration. These differences were not uniform, however, since in one case the cocaine acted more promptly and in another apothesine. Not sufficient difference in the effects was observed to lead the subject to consider one better than the other. Her conclusions were, therefore, in accord with previous data.

To indicate degrees of anesthesia by the number of + signs is largely a matter of convenience in order to select for the next series of tests the dilutions of sample and

standard which should give equal anesthesia. It is a practice commonly followed in biological assaying. In the above tests apothesine and cocaine continued to have practically equal efficiency and required no change except to dilute further to see if at any point the efficiency of one of them fell off compared to the other.

There was no attempt made to obtain final results on the experimental product.

It is improbable that any synthetic substance can be prepared which will equal the quick penetrability of cocaine into mucous membrane. This fact, however, should not inhibit the use of other local anesthetics if the amount and the strength of an effective solution is not poisonous and causes no untoward symptoms.

Apothesine is one-third to one-fourth as effective as cocaine for mucous membrane anesthesia. The reason is that it is absorbed more slowly and destroyed more rapidly than cocaine. Clinicians have observed no untoward effects from apothesine when used for this purpose, and in fact question whether the ratio should not be one-half instead of one-third. The factor of toxicity is negligible in any case because of the small amount absorbed and its rapid destruction.

The action of a local anesthetic on the mucous membrane cannot be measured readily. It is assumed that the relative potencies of these substances on mucous membrane will be approximately the same as their action on the frog's skin, since normally this is always moist and differs from the human skin in not being impervious to substances in aqueous solution.

The test is carried out on a frog, deprived of its brain and heart, by immersing one foot in a solution of the anesthetic for any definite period—as, for example, 2 minutes—then after removal and drying, both feet are dipped into a dilute solution of hydrochloric acid (1/5-per-cent solution).

Anesthesia partial or complete can readily be noted by a delayed removal or failure to remove the anesthetized foot from the acid solution while the untreated foot is promptly withdrawn. A plus (+) sign indicates complete anesthesia when the treated foot is not withdrawn from the acid bath, while the untreated foot is withdrawn at once.

A plus or minus sign (±) indicates partial anesthesia shown by a delayed withdrawal of the treated foot.

Zero (0) indicates that neither foot is withdrawn from the solution, and the frog is no longer available for comparison.

The following results were obtained:

APOTHESINE.

Solution.	Time immersed.	Response at 2 min.	7 min.	12 min.	17 min.	22 min.	27 min.
3%	2 min.	+	+	+	+	+	0
2%	2 "	+	+	+	+	0	
1%	2 "	+	+	±	±	±	±
1%	2 "	+	+	+	±	±	0

COCAINE.

1%	2 min.	+	+	+	+	+	+
.5%	2 "	+	+	+	+	+	0
.3%	2 "	+	+	±	±	±	0
.3%	2 "	+	+	+	±	±	±
.25%	2 "	+	±	±	±	±	±

The potency of apothesine is one-third to one-fourth that of cocaine applied in this way.

It seems needless to discuss the M. L. D. of local anesthetics, for it is a well-known fact that deaths from their use are not because of a near approach to that dose in clinical or dental practice, but to certain idiosyncrasies or to the previous condition of the patient.

In other words, with the exception of cocaine, the commonly used local anesthetics are applied in doses relatively minute in comparison to the M. L. D.

The following experiment readily demonstrates the relative toxicities of cocaine and apothesine on guinea-pigs. While the use of pigs for such experiments has been decried by some who contend that the cat more nearly than the rodent resembles the human in its response to the series of drugs,[6] it should be observed that the purpose of such experiments is not primarily to establish any definite dosage for clinical

use, but to compare a new local anesthetic with cocaine under exactly the same conditions.

It should be noted further that where guinea-pigs are available for such work they are usually selected because they are more convenient in every respect.

APOTHESINE IN 10-PER-CENT. SOLUTION.

Injected subcutaneously in doses calculated on the kg. weight of the pigs.

0.350	0.15	Recovered
0.345	0.20	"
0.420	0.25	Dead
0.370	0.25	"
0.390	0.20	Recovered

COCAINE IN 2-PER-CENT. SOLUTION.

0.385	0.03	Recovered
0.410	0.04	"
0.445	0.05	Dead
0.430	0.045	"
0.040	0.045	Recovered
0.380	0.5	Dead

M. L. D. Apothesine 0.25
" Cocaine 0.05
Ratio of toxicity, 1/5.

It will be observed that the results of these tests differ materially from those recorded by Eggleston and Hatcher[6] (p. 444), where it is shown that apothesine is three-fourths as toxic as cocaine, while my results show it to be one-fifth. Is the difference due to the technique of the operator, the animal employed, or to the method of administration?

The question of the minimum lethal dose is open to different interpretations. Some select a method similar to that used in clinical practice for the drug to be tested, while others select the method which kills with the smallest dose and most quickly. Eggleston and Hatcher[6] (p. 443) selected the method which determines the maximum toxicity "after very rapid intravenous injections of concentrated solutions." Why? In view of one of their conclusions (p. 480), that "the toxicity of the local anesthetics for the cat after subcutaneous injection has been shown to depend upon the ratio between the rate of absorption and that of elimination," their selection of the intravenous route seems inexplicable.

The selection of this method is logical only if the drug so tested is to be used in this way. But local anesthetics are never used intravenously, are never used in strong solutions, and are never injected rapidly.

Another reason against the selection of this method for comparing apothesine and cocaine is that they differ so greatly in the rate of destruction in the body; the former is destroyed very rapidly and cocaine very slowly[6] (pp. 460 and 463).

This is the important factor which accounts for the greater difference between their toxicities by subcutaneous than by intravenous administration.

Eggleston and Hatcher recognize this factor when they say: "The toxicity of the local anesthetics for the cat after subcutaneous injection has been shown to depend upon the ratio between the rate of absorption and that of elimination."

They supply data which very nicely illustrates the point. In one experiment[6] (p. 453) they injected a cat with 20-mg.-per-kg. doses of apothesine repeated every fifteen minutes until 190 mg. per kg. had been injected in 2¼ hours. No serious effects followed, the only observable effect being "a slight motor excitation," which might be expected after nine hypodermic injections.

In another experiment[6] (p. 453) a cat was injected with 10-mg.-per-kg. doses of cocaine at 15-minute intervals until 50 mg. per kg. had been injected. The effects were as follows: "Very hyperexcitable, almost in convulsions . . . clonic spasm followed by tetanic spasm" over a period of a half-hour. Four hours afterwards the animal had not recovered; it was still "depressed." This cat got about one-fourth as much cocaine as the other got of apothesine, and almost died, while the apothesine cat was scarcely affected.

From their data quoted above, we note that 190 mg. of apothesine per kilo caused no unpleasant symptoms, while 50 mg. of cocaine almost caused convulsions, and the cat was greatly depressed for at least six hours. The reason for this is summed up in their further statement that apothesine

is destroyed in the body at the rate of one fatal vein dose every fifteen to twenty minutes, while in the case of cocaine one and one-third times the fatal vein dose is not destroyed in twenty-four hours.[8]

From this same data another striking conclusion may be drawn. According to the Council,[5] "when toxicity tests of local anesthetics are made on cats these animals seem to respond to the drugs in a manner more closely approximating humans."

If a cat can be given 20-mg.-per-kg. doses of apothesine nine and one-half times in two and one-fourth hours, or a total of 190 mg. per kg., on the same basis a 70-kg. human could safely be injected with 21 grains every fifteen minutes, or 200 grains in a period of two and one-fourth hours. This leads to the logical deduction that the toxicity of a local anesthetic such as apothesine, which is rarely given in doses to exceed 5 grains, may be safely ignored when considering its properties.

Surely the rate of absorption and elimination is more important than the absolute dose, so why not use the data available? Ostensibly because[5] "one cannot reliably estimate the degree of clinical danger on animals."

This latter statement is not, however, in accord with a further statement, as follows:[5] "It is a suggestive fact that the more toxic of local anesthetics as shown by tests on cats have been found the most dangerous in clinical use."

Cocaine is near the top of their list, procaine at the bottom, but Hatcher and Sollmann have had reported to them four cases of procaine poisoning and five cases from cocaine[6] (p. 437). No other data have been published by these investigators to substantiate the statement.

The authors gave experiments where adrenalin was used with the local anesthetics intravenously and their conclusion that[6] (p. 486): "The simultaneous injection of epinephrin (adrenalin) with the local anesthetics materially reduces the toxicity, but this reduction is much less marked in the cases of cocaine and holocaine than with the other members of the series, and is referable to their much slower 'essential elimination.'"

Stripped of its peculiar verbiage this means that in the case of cocaine, elimination could not keep pace with even the delayed absorption, while in the case of apothesine because of the delayed absorption elimination kept pace until the M. L. D. was doubled.

This point has also been observed by Hamilton,[9] who explains its action by the intravenous route differently. The action of adrenalin on the heart is exactly the reverse of that of apothesine—that is, a strongly tonic action—so by the proper timing of the adrenalin dosage it is possible to have very little depressant action on the heart from a dose of apothesine even when administered intravenously.

On the other hand, the value of adrenalin in this mixture when used subcutaneously is correctly stated by Hatcher and Eggleston to be a material delay in absorption which permits the elimination or destruction to keep pace with it.

When the two are injected subcutaneously as in clinical and dental practice, the constriction of the veins and arteries by the adrenalin prevents or retards the absorption of the drug, lowering its toxicity, and further, by this same action, adrenalin prolongs the anesthesia and tends to make weaker solutions more effective.

The use of an active member of the digitalis series also acts to reduce toxicity by its tonic action on the heart[7] (p. 480), for the same reason and in the same way as in the case of adrenalin, when the latter is applied intravenously.

From the foregoing data partly prepared for this paper, and by selection of data published by Sollmann, Eggleston and Hatcher, it is evident that:

First, the relative toxicities published by Eggleston and Hatcher have no relation whatever to the relative safety of cocaine and apothesine in clinical or dental practice.

Second, the same may be said of the data on toxicity prepared for this paper,

which shows that cocaine is five times as poisonous as apothesine, since the M. L. D. is never approached in dental or clinical practice.

Third, the safety of apothesine in comparison with cocaine is shown by Eggleston and Hatcher in the experiments, where no serious results followed the administration of doses of the former, while one-fourth as much cocaine almost killed the cat.

Fourth, the efficiency and safety of apothesine is increased by the addition of adrenalin, because of delaying absorption, and by the addition of digitalis because of its tonic action on the heart.

Fifth, for two of the commonest uses of a local anesthetic (for terminal anesthesia and nerve blocking) apothesine is as potent as cocaine.

Sixth, it is an effective, non-toxic, non-habit-forming local anesthetic, especially valuable for terminal anesthesia and nerve blocking.

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RAT DESTRUCTION.

WHITE, in the *British Medical Journal* of November 15, 1919, states it is almost unnecessary to remind the reader that the "rat problem" has been for many years and is a problem of the highest public health importance in India. Bubonic plague, so essentially a rat disease, has been responsible for upwards of ten and a half million deaths since the invasion of India by plague in 1896.

Though Indian experience may well be of assistance to those undertaking rat campaigns in England, it must not be forgotten that in India the greatest efforts have to be directed against the black rat, *Rattus rattus*, whereas in England the brown rat, *Rattus norvegicus*, is responsible for most of the damage done. The habits of the two species present striking differences. *Rattus rattus*, formerly the common rat of England, is now rarely seen outside the ports and large towns; its disappearance is generally ascribed to the advent of *R. norvegicus*. It would seem probable, however, that changes in the customs and habits of the people have had quite as much, if not more, to do with the elimination of *R. rattus;* both species flourish exceedingly in certain eastern cities such as Bombay, where there does not appear to be any marked antagonism between the two species. Their haunts differ, it is true, but they have their common meeting places.

This short article deals chiefly with rat destruction by means of poison. It must not be concluded that this, or all the means of destruction put together, is the most important measure that can be adopted in our efforts directed to the elimination of the rat. The protection of foodstuffs from the depredations of rats; efficient scavenging; the proper construction of warehouses, stores, markets, shops, granaries, dwelling houses, etc.—all such measures are likely to prove of more permanent benefit and even cheaper in the long run. A direct attack on the rat involves a constant struggle against the remarkable fecundity characteristic of all species of the genus. As a temporary measure, however, rat destruction may be an imperative necessity, notably in the event of a threatened outbreak of a rat-borne disease.

Many well-intentioned and energetically prosecuted rat campaigns in India, and doubtless in England also, have yielded disappointing results owing to too little attention having been paid to the habits and customs of the particular variety of rat against which war was being waged. This is a matter of very considerable importance. As in so many other matters, chief reliance has been placed in traditional

methods, which are by no means always the most efficient. It is commonly stated, for instance, that rats are omnivorous and thrive best on a varied diet. Some go so far as to advocate that the baits of traps and the vehicle for poisons should consist of substances not readily obtainable by the rat. It is true that rats will eat almost anything if driven by hunger to do so; they will become cannibalistic in captivity if deprived of water; but *R. rattus*, at any rate, is for choice almost incredibly conservative in its diet, dislikes variety, and is a strict vegetarian. As a result of some most interesting observations carried out in Poona by Chitre in an investigation started by Kunhardt, it was shown that rats from various parts of India exhibited a marked preference for the food grain, or dough made from the food grain, which formed the staple food of the human population of their place of origin. In comparison with this all other foodstuffs were comparatively unattractive. Moreover, the rat displayed an astonishing aptitude for detecting dough made from the grain to which it had been accustomed, when several varieties were offered to it in exactly similar form. For example, the Poona rats are "bajri" eaters, the Madras rats chiefly rice eaters, and so on. The experiments were most carefully carried out on a very large scale and under conditions as natural as the limitation of such an experiment permits; the results were confirmed time and again and are beyond dispute. The addition of such substances as cheese, for which rats are popularly supposed to have a marked predilection, sugar, various essential oils, and numerous other substances were tried, with the result that none of the flavored baits were as attractive as the plain dough baits. Even butter and other fats and oils detracted from the attractive value of the plain dough bait; such substances are commonly recommended as desirable ingredients of poison baits.

The bearing of such observations on the efficient prosecution of a rat campaign, be it by means of trap or poison, needs no elaboration.

A comprehensive knowledge of the habits of rats is likewise essential to the designing of "rat-proof" dwellings and buildings if such are to be kept rat-free. *R. rattus* is unable to jump higher than 2½ feet; it is unable to circumvent a horizontal ledge of 9 inches, provided this be smooth on the under surface; it cannot live on dry grain without a certain amount of water to drink; such points are all important. White is unable to quote similar facts about *R. norvegicus;* they could, however, easily be ascertained experimentally.

All the commonly recommended rat poisons, and several others, were subjected to investigation, with the result that none were found as efficient as barium carbonate, which is one of the very few poisons that the rat fails to detect. It is safe to handle, and in the amounts necessary for use it is not dangerous to children. It was found that 15 grains were necessary to kill a cat, 20 grains to kill a chicken, and that dogs could withstand a dose of 140 grains. Phosphorus poisons are relatively distasteful however offered.

In India poison baits are recommended to be made as follows:

One pound of barium carbonate is mixed thoroughly with three pounds of flour made from the grain which forms the staple food of the human population of the locality in which operations are to be carried out. The mixture can be conveniently made in an enameled basin. Sufficient water is added to make the whole into a fairly firm paste. The resulting mass is sufficient for some 2300 baits, each containing 3 grains of barium carbonate. Clean hands and dishes are necessary to avoid the addition of extraneous taste and odor which might diminish the attractiveness of the baits.

Baits should be made fresh each day, or at most every second day; a hard, stale bait is very rarely eaten by a rat. The baits are distributed in groups of four in such parts of a building as are frequented by rats; this is best done in the evening. A record should be kept of the number of baits so distributed and the number taken. During poisoning operations special efforts should be made to keep all food usually available for rats covered up.

EDITORIAL.

THE USE OF ALKALOIDS IN SURGICAL ANESTHESIA.

There can be little doubt that the administration of a hypodermic injection of morphine, or of morphine and atropine combined, permits the surgeon to perform any surgical operation with the use of a smaller amount of ether or chloroform than would be otherwise necessary, but there are a number of objections to this practice.

The first objection is that we have before us a patient who is under the influence not of one drug, but of several. Again, if the operation is upon the upper air-passages the morphine by benumbing reflexes may tend to permit blood and secretions to get into the deeper parts of the respiratory tract, and, also, it is to be recalled that different patients react differently to morphine. Some of these have so much after-nausea and vomiting that they suffer more from the morphine than they would had ether been used alone. Again, the morphine tends to induce constipation and also the accumulation of gas in the bowel.

Against these disadvantages are the, already mentioned, smaller amount of anesthetic usually required, the absence of profuse pharyngeal and nasal secretion, the persistence of analgesia when the patient comes out of the anesthetic, as when operations have been done upon joints and bones, and by no means least, the fact that the patient is so benumbed before operation that he does not dread it during the hour or two preceding his entrance into the operating-room.

Although scopolamine has been largely used in association with morphine either to produce anesthesia adequate for operation or to help ether or chloroform produce anesthesia, we believe we are correct in expressing the opinion that the old combination of morphine and atropine is the best for the general run of cases. There seems to be some doubt about the identity of hyoscine and scopolamine both chemically and physiologically. Furthermore, it would appear that scopolamine is not as safe either by itself, with morphine, or with a general anesthetic, as is atropine, and atropine possesses the additional advantage not only that it prevents excessive secretion in the respiratory passages, but that it equalizes the circulation and prevents a great accumulation of blood in the splanchnic area. On the other hand there seems to be little doubt that scopolamine is the more powerful drug for the relief of pain than atropine.

In this connection we note with interest the statements made by Barton, who is the anesthetist to King George's and other hospitals in London, that the action of atropine and its cousins upon the pupil may embarrass the anesthetist unless he is familiar with them. He thinks that atropine produces little effect upon the pupils of adults when under a general anesthetic, and that therefore the pupil may be taken as a guide in the different stages of anesthesia; but he also points out that when accompanied by morphine the latter drug contracts the pupil during general anesthesia, and that this contraction is an indication of the effect of the morphine upon the patient in general, since if it is pronounced the patient will require very little ether or chloroform. The only fallacy underlying this observation is that in old people the contraction may be very decided without having such significance.

Another point mentioned by Barton deals with the matter of administering morphine and atropine to patients who are to have operations upon the nose and throat. He believes that the decision depends more upon the surgeon who is to operate than upon the character of the operation. As he says, much will depend upon the methods of the surgeon, for in some hands an operation is almost bloodless and in others very gory. If the operation is a short one and the patient's head can be

quickly put in such a position that the blood gravitates from the danger zone, these drugs may be used, otherwise not.

Concerning the dose of morphine, Barton is of the opinion that ¼ grain is the proper one for an adult. He states that in England they have an aphorism that one-sixth is too much for chloroform and not enough for ether. A large dose is always indicated in robust patients or those of alcoholic type, whereas in the old and puny, one-sixth or even one-eighth may be the wise amount. The dose of atropine or scopolamine which he employs is 1/100 of a grain, but he never uses the latter drug in young adolescents or in the aged.

Particular caution must be taken in administering morphine to children, whose secretions are apt to be excessive and whose respiratory passages are narrow.

The administration of these drugs by the mouth is never satisfactory and should always be by the hypodermic needle, and it should precede the general anesthetic for at least an hour, although too long a time should not be allowed to elapse between the injection and the time of administration of the ether or chloroform.

THE DANGER OF ANAPHYLAXIS.

We have recently called attention in the GAZETTE to a series of accidents that followed the use of so-called toxin-antitoxin against diphtheria, and in that instance we pointed out that isolated accidents should not be allowed to interfere with the carrying out of a line of treatment which will save life in a multitude of patients. We reminded our readers that while diphtheria antitoxin had on a number of occasions produced death as a result of anaphylaxis, the number of these untoward effects was very insignificant as compared to the thousands of lives that the free use of antitoxin has saved.

Boughton has, however, recently reported another case of anaphylaxis in the *Journal of the American Medical Association*, and, according to his statement, one minim of normal horse serum was administered intravenously to a patient who had been a sufferer from asthma for ten or twelve years, his age at the time of treatment being twenty-nine. Within two minutes after the injection a typical attack of asthma supervened, and although he was given adrenalin intravenously with temporary relief after each injection, nevertheless he died forty-five minutes after the injection of the serum.

As the author points out, this patient should, undoubtedly, have been treated with highly diluted serum to determine whether he was sensitive, and if this had been done and preliminary injections of very minute quantities given subcutaneously, it is possible that no such after-result would have accrued as did take place.

Indeed the question naturally arises whether it is ever necessary to give serum intravenously unless the condition of the patient is so grave that one is willing to run the risk of death from anaphylaxis rather than from the disease.

As Boughton points out the extraordinary sensitiveness of his patient was far in excess of any other that has been reported. In many instances we do not know how much serum was employed, because the reporters of cases speak of the dose in units rather than in minims or Cc.

It is rather interesting to note that some of the early cases of anaphylaxis still take a prominent position when this subject is discussed, proving that either anaphylaxis is so rare that one must go back to earlier cases to find records, or that increased knowledge as to danger and methods of desensitization have minimized the danger.

Another point of importance which needs emphasis is one which is generally known, namely, that all asthmatics should be considered as bad risks for the injection of all foreign proteins, and as Boughton points out, no asthmatics should receive curative or prophylactic serum until their sensitiveness has been tested by the cutaneous method. He believes that if the patient proves to be insensitive the horse serum is probably safe, and, further, that

when a patient is proved to be sensitive to horse serum it is possible that he will be found to be insensitive to serums derived from other animals than the horse.

In our Progress columns will be found a note in regard to a case of anaphylaxis occurring in England in which the physician treated the patient not only by the use of adrenalin, but was bold enough to resort to the free administration of chloroform. While recognizing the dangers attached to the use of chloroform in any patient, the reporter expresses the belief that he was justified in its use because he thought it would relax the bronchial spasm. Whether the fact that this patient recovered indicates that the treatment was wise or unwise cannot be considered as determined. Many physicians have believed for a long time that hypodermic injections of ether or inhalations of ether would prove advantageous in anaphylaxis.

THE USE OF CALOMEL BY INUNCTION.

The fact that calomel when rubbed up with an ointment base forms a salve which is colorless and which, therefore, can be used without the obvious disadvantages of blue ointment, has within a few years rendered this comparatively new method of treating syphilis exceedingly popular, the more so as a number of investigators seemed to prove by actual experiment that a large amount of mercury could be made to pass into the body by its use. Further investigation, however, seems to indicate that it is not as rapidly absorbed as has heretofore been supposed even when a 50-per-cent calomel ointment is used. Although the laboratory investigations seem to point to an opposite conclusion from this, nevertheless in a paper recently published by Cole and Littman, they have reported 54 cases in which they have used it and believe that their clinical experience justifies them in condemning calomel ointment as a substitute for the old-fashioned blue ointment. They point out that the rarity with which salivation and soreness of the gums develop is not indicative of this ointment being superior to mercurial ointment, but shows that it does not enter the body so freely. This is an important point since, in the treatment of syphilis, it is of the utmost importance that the treatment shall be efficient, and moreover that it shall be prompt in its effects.

SURGICAL TUBERCULOSIS.

Many active practitioners of medicine remember the time when in the profession there were two camps: one maintaining that tuberculosis was a bacterial disease and capable of transmission from one to another; the other holding with stubborn determination to the view that it was a mysterious malady, probably an inherent degeneration of tissues passed from parent to offspring.

With the universal acceptance of the bacterial nature of this infection there was a further dual view bearing on heredity. Even after years of laboratory and clinical study there remained, and still remain, a few who hold that the bacterial infection may be acquired before birth. The majority of practitioners believe that though through the ovum or spermatozoön, or by transplacental affection, such a prenatal transmission is theoretically possible, clinically it is one of comparative rarity.

Fraser (*Edinburgh Medical Journal*, January, 1920) quotes MacFadyen and MacConkey to the effect that they have been able to produce tuberculosis in guinea-pigs by injection of the mesenteric glands of a still-born infant. Laboratory investigation suggests that embryonic fetal tissues possess a powerful retarding effect upon the growth of the tubercle bacillus. Fraser holds indeed that this influence will certainly be continued for some time after birth. It is possible that such an influence may to some extent explain the low proportion of tuberculous infection which occurs in the first six months of life.

It has been at least experimentally shown that individual tissues under certain condi-

tions vary in resistance to the tuberculous disease. Thus there is an enormous difference in the susceptibility of the pregnant and virgin uterus of cows. The latter, like skeletal muscle, is very insusceptible to tuberculosis.

Concerning the portal of entrance, of the three possible ones the skin is the least important, although Tubby is quoted to the effect that he has been able to trace a distinct tuberculous infection producing dactylitis, incident to a child crawling about a floor upon which a phthisical patient was frequently spitting.

The inference that Tubby's conclusion shows a vivid imagination which dominates close clinical observation is at least a fair one, since this form of dactylitis begins in reality as an osteomyelitis of embolic origin, the primary source of the infection being invariably in the mesenteric or bronchial glands.

Of the remaining two portals of infection, the respiratory and the alimentary mucous membranes, the latter in surgical tuberculosis is the more prominent. It is the avenue of infection which leads to tabes mesenterica, and to tuberculous disease of the bones and joints. In tuberculosis of the cervical glands, the tubercle bacilli have entered through the mucous membrane of the mouth or nasopharynx, or through the mucosa environing a carious tooth. There need not be, in fact there very rarely is, any visible disease of the mucous membrane through which the infection has occurred.

It is an interesting fact, and one which perhaps is insufficiently appreciated, that glandular disease is the original basis of practically all forms of surgical tuberculosis. It is the primary manifestation in disease of the large palpable glandular chains, and in bone and joint tuberculosis disease of the mesenteric or bronchial glands is the primary source.

During the later years of the war the effect of nutrition upon the incidence of tuberculosis has been demonstrated. The statement has been questioned that during this period surgical tuberculosis has shown an incidental increase, but such an increase has occurred. The imperfect nutrition from which children in common with their elders have suffered, and more especially the diminished supply of fats, have been responsible, in a very large measure, for the increase.

Various attempts, based on Bordet's phenomenon, have been made with a view to determine whether, in tuberculosis as in syphilis, a diagnosis of the condition could be established by the complement deviation method.

The most recent investigations along this line have been published by Wang and Crocket. A special feature of the technique which they employed was the type of antigen. Previous experimenters had used preparations or extracts of the tubercle bacilli in some form. Wang and Crocket employed the bodies of the tubercle bacilli after their fatty substances had been removed, and this they secured by extraction with alcohol, ether, and chloroform.

The interpretation of their results may be summarizzed as follows: In the routine method three tubes were employed: the first was a pure control, the second was a modified control containing syphilitic antigen, and the third contained the tubercle antigen. A negative serum was indicated by a complete hemolysis in the third tube (one containing the tubercle antigen) when the first control tube remained clear.

A positive serum was indicated when hemolysis was complete in the first and second tubes, but absent or only partial in the third tube; the strength of the reaction being judged by the degree of hemolysis.

The observers recognized that a possible source of error arose in those cases in which an inhibition of complement by a serum was observed in both the second and third antigen tubes. It is known that a tuberculous but otherwise normal serum may give a positive Wassermann reaction; and conversely, that a strong luetic serum may yield a reaction with a tubercle antigen. Therefore, to distinguish one reaction from the other, means had to be found by

which the Wassermann reaction could be abolished. The methods previously adopted to secure this were inapplicable, because not only did they abolish the Wassermann reaction, but they also removed the greater part if not all of the tubercle antibody.

The method introduced by Wang and Crocket was as follows: The suspected serum, whether previously inactivated or not, was mixed with an equal quantity of saline in a tube, and to each centimeter of the mixture two or three drops of chloroform were added. The tube was vigorously shaken for ten to fifteen seconds and afterwards placed in a water-bath at 55° to 56° for fifteen minutes.

For use, the supernatant fluid was drawn off and the test proceeded with, the original dilution with saline being allowed for. In from ten to twenty minutes after the sensitized corpuscles had been added the results were read. "When less hemolysis is observed in the tubercle antigen tube than in the syphilitic antigen one, the serum is tuberculous in addition to being luetic. If, on the other hand, the converse is the state of hemolysis, the probability is that the serum is only specific and not tuberculous."

The investigation embraced a series of 104 tuberculous subjects and 220 controls. The large majority of the cases were pulmonary tuberculosis, but included in the series were five cases of surgical tuberculosis, four of tuberculous cervical glands, and one of tuberculous dactylitis, all of which showed a positive reaction.

From the surgical point of view it is questionable whether the test is one which will come into universal use. The technical difficulties which surround it are very considerable, and to be reliable an expert in complement deviation work is essential.

In the majority of cases the diagnosis of surgical tuberculosis by clinical observation is sufficiently definite: the diagnosis of tuberculous disease of the cervical glands, for example, is rarely in doubt. In the more doubtful cases of bone and joint tuberculosis, while the complement deviation test may be useful as confirmatory evidence, it is unlikely that it will replace the method of diagnosis by the injection of a massive dose of tuberculin. This latter method has the great advantage of inducing a focal reaction. Further, as surgical tuberculosis is so commonly complicated by a superadded syphilitic infection, the complement deviation test is liable to be thereby vitiated, though this possibility of error would appear to have been avoided by the investigation methods which have been detailed.

Newtown and Twinch make out a strong case for the employment of tuberculin. They believe that even in cases in which tuberculin finally loses its remedial efficiency it acts as a powerful general tonic. Waterhouse has lately published his experiences in the non-operative treatment of tuberculosis of the larger joints and the spine. He believes firmly in the value of tuberculin; he employs Koch's new tuberculin (T.E.), and he commences with 1/20,000 mgrm. given by subcutaneous injection; the injections are given weekly for twelve weeks, and the increase of each dose is 40 to 50 per cent. If decided reaction occurs after any dose, there should be no increase of the subsequent injection.

The opinions of these observers are an indication of a swing of the pendulum toward the more general use of tuberculin as a method of treatment. There can be no question of the enormous therapeutic value of tuberculin when it is administered judiciously, but its use, if it is to be of value, requires a vast amount of care and experience.

The success of bone-grafting for spinal tuberculosis has now become definitely established, but there are certain details of the method which must be adhered to if ultimate success is to be gained. Alkalies and carbohydrates should be administered for some days previous to operation, and chloroform should not be employed as the anesthetic of choice. These precautions are necessary owing to the frequency of acidosis in prolonged bone operations in the case of children. As the whole idea of the method is to induce the formation of

new periosteal bone and so secure efficient internal splintage of the spine, it is most important to separate the periosteum widely from the spines, laminæ, articular and transverse processes. Only by so doing can a sufficiency of new periosteal bone be formed. A spine which has been efficiently treated should at the end of six months show an appearance as though a quantity of liquid wax had been poured over the posterior surface—so profuse should be the new bone formation.

CONVALESCENCE.

By this term is understood that period when the infection having run its course, or a reaction to trauma having attained its maximum, the patient day by day grows better, and locally those processes are inaugurated and continued which lead to the return to normal, or as near that as conditions will allow. From the surgeon's standpoint convalescence begins with the termination of the operation, which if wisely planned and executed removes a condition which is not compatible with normal function. It is usually considered that this period of convalescence should be spent mainly in rest, both local and general; supplemented by a widely chosen and adequate diet, and that attention to elimination which experience has shown to be most helpful.

It is concerning this very matter of rest —that is, bodily and mental inactivity— that perhaps the major differences of opinion exist as to the proper convalescence.

Any pronounced jar, physical or mental, and particularly if the two are combined, is attended by an alteration of nutrition; grossly, marked by loss of weight, and if the patient be particularly sensitive, by a loss of ability for sustained effort either mental or physical. Taking as a type one of the simpler operations, yet one which ranks as major, appendectomy, whether this be practiced under local or general anesthesia, whether it be preceded and followed by fasting or a fairly full diet, whether the patient be gotten out of bed promptly, or be kept recumbent for some time, whether he be in the hands of a cheerful optimist or a gloomy foreboder of the worst, there will follow an uncomplicated operation a loss of weight of from five to ten pounds, and a corresponding loss of ability for sustained effort. The same will hold true in regard to hernia operation or any of the other ones of this type so frequently performed. Nor is the explanation of this loss rightly placed upon the restricted diet. It is true that these patients, as a rule, are not hungry for one, two, or three days, and if abundantly fed during that period are likely to suffer from digestive disturbance.

In this relation it is interesting to note that Bridgman (*Archives of Internal Medicine*, xxiv, 1919; quoted in the *British Medical Journal*, Sept. 20, 1919) contributes an analysis of the notes of 5000 soldiers treated in a convalescent camp in France, this analysis being made in the interest of an attempt to determine the proper length of convalescence by physical tests.

The underlying principle of the camp was to retrain soldiers by physical exercises in order that they should on their return to the front be both physically and mentally fit. On admission the stripped patients were physically examined, and were placed in one of three grades, promotion through which depended on ability to carry out the work and play of the particular group without bad symptoms, the drills being watched by medical officers. The results of this scheme were extremely satisfactory, as subsequent inquiry showed that more than 99 per cent of men discharged to full duty, and not killed, wounded, or gassed, had remained there, and that those reclassed to lower categories were doing the work of their grade. By this means the neurasthenia, anxiety neuroses, and effort syndrome which often follow return to the strains of life after a short interval from an acute infection or operation may be prevented.

The striking point about the periods of convalescence shown to be necessary by Bridgman's observations is that they are so much longer than those generally accepted in ordinary practice. The possibility that even a subconscious desire on the part of the American "doughboy" to remain out of the fighting line could have protracted convalescence was considered unlikely to apply to more than a very small percentage.

In ordinary life most patients with tonsillitis or sinusitis are out of bed and back at their daily work in seven to ten days, whereas these young soldiers who were previously in the best physical condition did not regain their normal strength for five weeks from the onset. An average attack of mumps requires a period of five weeks, pneumonia more than eight, and scarlet fever more than eleven weeks; operation for piles necessitates six and a half and for herniotomy seven weeks' convalescence. These results raise the uneasy feeling that we are often unconsciously taking risks, not only with our patients but also with ourselves, and that tuberculosis or cardiac disease may date from an infection followed by too short a respite from work.

Bridgman's report should not in the least lessen the enthusiasm of those who see in a short confinement to bed nothing but good, but it should draw attention to the fact that the convalescent patient requires long and careful watching and that he is not to be discharged from observation until he is as fit for his work as he was before a surgical procedure was practiced. This does not necessarily imply an absolute drop of all normal interests including those connected with business; it does imply a slow resumption of full responsibilities.

REPORTS ON THERAPEUTIC PROGRESS.

FLUCTUATIONS OF THYROSUPRARENAL ACTIVITY IN GENERAL DISEASES.

SAJOUS, in the *New York Medical Journal* of February 14, 1920, refers briefly to that disorder which is causing much anxiety —epidemic influenza. He urged in 1907 that this disease was an acute neurosis, with more or less marked paresis of the sympathetic system, which has also been called the chromaffine system, owing to its wealth in adrenal medulla. The toxin or filtrable virus of the disease, from his view-point, causes a paresis of the adrenal functions, which inhibits, therefore, general oxidation and metabolism, thus causing the familiar asthenia and low blood-pressure. The arterioles of all tissues, deprived in part of their adrenal hormone, are thus dilated, causing circulatory disturbances in various organs. In France, many clinicians, Lesné, Lereboullet, Lyon, and others, also refer to a vasodilating action of the disease toxin, and give adrenalin, from five minims every hour orally, not exceeding forty minims daily, to fifteen minims of the 1:1000 solution orally three times daily. Recently Cowie and Beaven, in view of the asthenia and low blood-pressure that are so characteristic of influenza and the pneumonia attending it, tried to ascertain whether hypoadrenia, *i.e.*, failure of the chromaffine system, did exist to account for the symptoms. They found hypoplasia of the adrenals at autopsy and evidences of inhibited function, thus confirming Sajous' views. Finally, we know that strychnine is our best tonic during convalescence. He has pointed out that it stimulates the adrenals, and Stewart and Rogoff recently (1919) confirmed this view.

This suggests what might prove to be a physiological prophylactic against influenza: a capsule containing one grain of desiccated thyroid gland (American preparation), to enhance our defensive functions and general metabolism; suprarenal gland two

grains, to provide against any existing deficiency of adrenoxidase; and strychnine one-fiftieth grain, to insure full activity of the adrenals. Taken three times a day, after meals, this capsule acts so efficiently as a tonic that some subjects who take it are brought to realize that they had previously been debilitated, which means vulnerable to infection.

As the disease usually develops in young subjects, the contraindications are limited to those suffering from serious organic heart disorders and advanced tuberculosis. Adynamic functional types, on the other hand, will be benefited. In middle-aged and elderly subjects, clearly defined arteriosclerosis, especially in the plethoric with tendency to apoplexy, or angina pectoris, removal of the strychnine will obviate all danger. The need of prophylaxis asserts itself, of course, only during an epidemic, but some subjects find their general health so improved that they persist in the use of the capsules much longer than is necessary. Ample nutritious food favors the protective process.

A PLEA FOR THE RATIONAL REMOVAL OF DISEASED TONSILS.

SULLIVAN, in the *Journal of the Medical Society of New Jersey* for December, 1919, considers that tonsillectomy by sharp anatomical dissection and enucleation by a snare is the nearest to perfect method as yet devised for the complete removal of diseased tonsils. He speaks of complete removal, as he cannot understand any excuse for an operation which has any other object in view, as disease cannot be eradicated by any less radical removal. By the first method there is less danger of injuring important structures and the tonsil is completely removed in capsule. There is also less severe hemorrhage. The second method would include dissection by a scissors or knife and removal entirely that way; this is prone to cause much local damage and very severe bleeding and seldom removes the entire tonsil. Under this heading would come the Sluder method with its many modifications, which he admits in a large percentage of cases is a very excellent operation; but only in the hands of the most expert operator could some tonsils he has seen be entirely removed by this method; while in the hands of the majority of men doing tonsillectomy it will cause no little local damage and considerable hemorrhage. The third method has little if any good qualities to recommend its adoption, and therefore should be discarded. It seldom, except in greatly enlarged tonsils, ever removes more than a small portion of the tissue, leaving behind the diseased parts, causing much local injury and considerable bleeding. Therefore he feels that having considered the three methods the first offers the best inducements for its adoption by the average surgeon doing tonsil operations.

Having reviewed briefly the various methods for the removal of diseased tonsils he presents for approval the operation he has been doing for the past six years, which is safe, sane, and easy to learn, and offers the best results with the least dangers and sequelæ.

First, the patient should be in a hospital and should, if possible, remain there from two to four days following the operation, and should be seen every day thereafter until the fossæ are entirely healed.

The anesthesia of choice in children is general, preferably ether; in some adults local cocaine and adrenalin or apothesine and adrenalin; in others general, and again he prefers ether. The instruments needed are a Jennings mouth-gag, a tongue depressor, two Leland right and left tonsil knives, one Ballenger volsellum tonsil forceps, a Beck-Schenck and Eves tonsil snare, and three curved hemostats. The patient is anesthetized lying on a table, and when sufficiently under the anesthetic is lifted into a chair and sterile sheets thrown over the body to the neck. The anesthetist assumes his position standing behind the patient supporting the head and shoulders. The ether is now given by the Beck-Mueller ether

vapor and suction apparatus, with the suction attachment used for removing blood and secretions. The operator is seated in front of the patient with the instrument table on his right no higher than the level of his shoulder. The only assistant, a nurse, stands behind this table and is used solely to keep sponges in the three hemostats.

The ether tube is placed in the left cheek and the mouth-gag inserted. The tongue is depressed, secretions sponged away, and Leland's right-angle knife is inserted high up behind the anterior pillar of the right tonsil, and, with one stroke downward closely following the margin of the pillar to the inferior portion of the tonsillar attachment, the tonsil is freed anteriorly. It is then seized with the volsellum forceps and drawn outward and forward from its fossa. The tongue depressor is now discarded temporarily, the volsellum forceps replacing it to control the tongue, as he finds it inadvisable to have more than two instruments in the mouth at one time. The same knife is again inserted and the tonsil separated from the posterior pillar by a downward and backward stroke, beginning at the superior margin of the tonsil, adhering closely to its periphery during the entire stroke to avoid injuring the posterior pillar. Again the blood and secretions are removed, at this time preferably by the suction apparatus, and the dissection now being completed the snare is inserted over the volsellum forceps and encircles the tonsil at its base, care being taken during this maneuver to avoid catching the uvula in the snare wire. With the snare in place slow traction is begun by hand and finished by the ratchet attachment until the tonsil is completely enucleated. A dry sponge is now firmly pressed in the tonsillar fossa and retained there for about one minute, when the fossa is inspected, and if found bleeding another sponge is inserted which is saturated with thromboplastin and retained for thirty seconds or more, when it is again inspected and the fossa is usually found dry. He then proceeds to remove the other tonsil in the same manner.

During the entire operation the average number of sponges used is about six. Other structures than the tonsil are seldom damaged, and the view in the sitting position is all that can be desired with no disadvantages over the prone position. The operation requires from ten to fifteen minutes. He has never had any severe primary bleeding, but has had two rather serious secondary hemorrhages occurring twenty-four hours after the operation. One was in a boy six years of age and the other in an adult; both were very promptly checked by the use of thromboplastin packed in the fossa for fifteen minutes.

In adults with fibrous tonsils he would advise the use of Eve's tonsil snare double threaded to prevent the wire from pulling out.

A PLEA FOR THE EARLIER RECOGNITION OF SUBACUTE INFANTILE SCURVY.

PORTER and CARTER in the *California State Journal of Medicine* for December, 1919, state the fact that scurvy is known to develop in a small percentage of breast-fed infants and in some fed on raw milk, which leaves the question of an exact etiology open. But about one thing there is unanimity of opinion, and that is that the feeding of antiscorbutics, orange juice, tomato juice, potato, and the like, is always indicated, and that these foods are equally valuable in the prevention and in the cure of the disease. Therefore a failure to advise mothers regarding the prophylactic use of such substances can never be justified.

The diagnosis of the most frequent, though least recognized, form is easy after a careful history has been taken and clinical observations made. The mother complains that the child is "fussy" and irritable and that it cries when she takes it up. There usually is no swelling of the epiphyses at this stage, but it is probable that there is a history of easy bruising and there may be hemorrhagic spots somewhere over the body. One of their cases showed no other sign than a black-and-blue ring around the

buttocks where a tightly pinned diaper had made pressure, and some tenderness referable to the bones. The diagnosis of subacute scurvy was justified because both symptoms cleared up promptly when the child was given orange juice and potato cream—a therapeutic test which can easily be applied to all suspicious cases with an assurance that no harm will be done even if some other cause of tenderness and easy bruising be found. In the category of subacute forms may be placed several reported cases in which hematuria was the predominant or only symptom of the disease—a symptom which rapidly vanished when antiscorbutic foods were added to the dietary.

In this connection it is interesting to note that a disinclination to move the legs may be a symptom of that common disorder of female infants, cystitis. It also occurs in syphilitic involvement of the bones.

As in the fully developed florid form, a careful history will usually elicit the fact that the child has been fed on an overheated food. In cases developing in breast-fed infants, the possibility of some definite constitutional disturbance on the part of the mother should be considered. The beginning of the disease is usually gradual. Close questioning will usually indicate that there was a period of anorexia, head sweating, pallor, anemia, restlessness and discomfort of varying degree before the onset of the alarming symptoms. The major symptoms appear with dramatic suddenness. The child seems to have become paralyzed, and after a few hours or days of pseudo-flaccid palsy it assumes a characteristic dorsal position with flexion and outer rotation of the thighs, or, if the upper extremities are affected, a pseudo-palsy simulating the Erbe type is present. Swellings appear at the region of the epiphyses. Those most commonly affected are the lower epiphyses of the tibiæ; after these the epiphyses of the hip-joint and the upper epiphyses of the humerus. The swellings are due to hemorrhages by which the periosteum is raised, causing great tenderness. Any epiphysis in the body may be the site of the hemorrhage. The growth cartilages of the vertebræ may be involved in the process, and such cases have been often mistaken for acute Pott's disease.

Hemarthroses are also found, while such a bizarre occurrence as a hemorrhage under the periosteum of the orbit resulting in a unilateral proptosis which occurred in one of their cases has been cited by Debuys as occurring in some 10 per cent of the 397 cases studied by the Committee of the American Pediatric Society. Even before these major symptoms develop an examination of the mouth may reveal spongy gums which bleed on the slightest trauma. At the same time the skin may show evidence of cutaneous or subcutaneous hemorrhages.

Any mucous membrane, as well as the skin, may be the site of a hemorrhage. If this occurs along the course of the gastrointestinal tract, melena may be in evidence—sometimes it is even the earliest symptom. Fever may or may not be present. Severe and neglected cases frequently show the cardiorespiratory syndrome first described by Hess in 1917. It consists of a broadening of the base of the heart as shown by percussion and the radiograph, and a marked increase in pulse and respiration rate. Hess believes this condition is due to a nerve affection similar to that found in the "deficiency diseases," adult scurvy, beriberi, and pellagra. Since reading his communication they have twice encountered the syndrome, which undoubtedly they overlooked in their earlier cases.

The chance of confusing scurvy with other conditions is remote. The rarity of rheumatism during the first and second years affords a sufficient differential diagnosis. Syphilitic epiphysitis is not usually accompanied by evidences of external bleeding, and the history and concomitant symptoms of lues may be elicited. Sarcoma is usually limited, at least during its earlier stages, to a single bone, and the generalized tenderness of scorbutus fails to develop. Osteitis is also a disease without great hemorrhagic tendency and runs a characteristic febrile course. Furthermore, radio-

graphs of these varying conditions are pathognomonic.

In 1919, Riesenfeld reported a case, with accompanying radiographs, in which there were subperiosteal hemorrhages and changes in the epiphyses. He described the latter as "a horizontal irregular shadow seen at the epiphyseal line and giving the end of the shaft a distinctly hammered-out appearance." Talbott, Dodd and Petersen, studying the radiographic appearances of experimental scurvy in guinea-pigs, arrived at the conclusion that the "white line," first described by Frankel, is a constant sign of the disease and that it persists long after clinical recovery, indicating a slow process of repair.

It is their belief that the white line is of no great consequence in making a diagnosis in the early cases. The early radiographic picture reveals little more than subperiosteal hemorrhages.

OBSTETRIC PARALYSIS (ERB'S PALSY).

In the *Medical Record* of November 15, 1919, BOORSLEIN, in closing a paper on this topic, reaches these conclusions:

1. Obstetric palsy belongs to the domain of orthopedic surgery as any other congenital deformity of a limb.

2. Obstetric palsy should be treated on the same principle as anterior poliomyelitis and all the deformities should be watched and prevented.

3. The principle in peripheral nerve injuries to prevent overstretching and overuse of the denervated muscles should be applied here and the weak muscles watched.

4. The shoulder should be put immediately in a splint or brace to prevent stretching of the deltoid and allow absorption of hemorrhage and repair of the damaged nerves.

5. In most of the cases the injuries to the nerves are not severe and if treated early will recover.

6. About three months may be allowed for conservative treatments in the early cases. If no marked improvement is obtained, an operation on the plexus should be resorted to.

7. Conservative treatments consist of proper support, massage, and exercises. There is no use in resorting to the universal panacea "electricity."

8. Taylor's operation on the plexus is very useful and should be performed after the conservative treatments have failed.

9. The contracted pectoralis major, subscapularis and teres major should be cut by Sever's method if effectual results be desirable.

10. A patient suffering from this affection should be under proper observation at least till the age of ten, as slight deformity may persist up to this age.

ETHER-OXYGEN WARM VAPOR.

MCCORMICK, in the *Ohio State Medical Journal* for December, 1919, directs the preparation of the patient for operation as follows:

Give alkalies for several days before operation. Daily bowel movement is good for the patient; but do not give cathartics. Hodges in 1916 noted that his patients who received cathartics had postoperative gas pains. Those receiving only enemas had none. Emge in 1918 corroborated this fact after observation of 100 cases.

The patient should be in the hospital for twenty-four hours in order that preparation of the operative field may be completed and enemas given early, thus permitting an undisturbed proper night's rest (if such be possible in our many noisy hospitals). Another enema is given in the morning. One hour before operation, 10 or 15 grains of chloretone is given, or, one-half hour before operation, a hypodermic dose of morphine 1/6 grain plus atropine 1/150 grain. A quarter-grain is too much unless the patient be excessively nervous or muscular. Some men, Hodges and Bieckle, give 15 grains chloretone one hour before operation. He finds 10 grains for women and 15 grains for a man sufficient.

The anesthetizing he advises is by the drop method carefully and smoothly given without any excitement stage. His average induction time is seven minutes. Nitrous oxide may be used to induce anesthesia. When the patient is under the change is made to vapor. The apparatus consists of a 100-gallon low-pressure oxygen tank from which the oxygen passes through a water bottle into the ether bottle. The combined ether-oxygen vapor next passes through a Davis heater, then through a rubber tube to the Gwathmey or Hunt mask.

Bevan and McCarty claim that warm vapor has no advantage over cold. Opposed to them with proof positive are Warbasse, Gwathmey, Hunt, Carleton, T. L. Dagg, Boothby, and C. N. Combs, who in 1918 on the Western Front stated "warm ether-oxygen has proved of exceptional value in critical cases."

The advantages of warm oxygen-ether are:

(*a*) Less ether is required.

(*b*) The anesthesia is quiet, smooth, and just deep enough.

(*c*) Oxygen counteracts any ether irritation.

(*d*) The color is better than under any other method. Even the anemic patient becomes more pink.

(*e*) More alkalinity, less acidosis.

(*f*) Less shock. An example: Pulse at 10.52 A.M. before operation, 127 plus; 2.30 P.M., three hours and forty minutes of continuous operating and ether-oxygen anesthesia, pulse 136; fair. Respiration 40, and good during entire period. Under what other method would the condition have been as good?

(*g*) After operation the anesthetic is quickly eliminated and consciousness regained quietly, without hysterics or "rough-house."

(*h*) Nausea or vomiting occurs in only 10 to 20 per cent of cases and is then usually slight.

(*i*) Oxygen improves the general condition of patients with heart, kidney, lung, and blood troubles, especially anemia and tuberculosis; for all show postoperative improvement.

(*j*) Infection and pus cases take it nicely.

(*k*) No other anesthetic is so easy upon kidney cases. The old idea that ether injures the kidneys has been exploded by Hunt, Thompson, Weir, Fauntelroy, Buxton and Long of Great Britain, and Hoyt, Jacobs, Logan, Parks, Smith, Steinke, and Weber.

(*l*) This plan is easy upon the expert physician-anesthetist, who alone is competent to give it.

Vignes expresses all the above in one sentence: "Warm vapors as used by certain American and British anesthetists induce anesthesia more rapidly and pleasantly, produce less irritation of the respiratory tract, less nausea and shock, and fewer postoperative pulmonary complications."

Since March 1, 1915, McCormick has given among thousands of anesthetics 626 ether-oxygen anesthesias in five hospitals for 65 operators. Many patients have been in bad condition; some almost hopeless, relatives, even the patients themselves, expecting death on the table. It seemed as though a few whiffs of anesthetic might be fatal. Under any other method some would undoubtedly have died. Ninety-five per cent have made good recoveries. All but three have recovered consciousness, even some who were pulseless before operation. The exceptions were:

(*a*) Man almost pulseless with both legs smashed by a train. Death from shock of injury.

(*b*) Ruptured ectopic pregnancy, pulseless, too late to save. Death from the hemorrhage before operation was actually begun.

(*c*) Man — enormous hypernephroma. Death from uncontrollable hemorrhage during operation which three good operators could not check, and which was unavoidable. In all these cases the attempt to save life was advisable.

McCormick says he is prepared to give

any anesthetic desired, but when the choice is left to him he uses the method best suited to the case, sometimes gas, sometimes ether. In spite of improvements in anesthetic agents and methods, ether remains and is ever likely to remain the safest. When to that we add life-giving oxygen, and especially when the combined vapor is warmed, we have the safest of all anesthetics, especially for long or dangerous operations.

RADIUM IN THE TREATMENT OF TUBERCULOUS ADENITIS.

MOLYNEUX, in the *British Medical Journal* of November 29, 1919, states that during 1913-14 he decided he would try and see what could be done for tuberculous glands by radium. As a result he is convinced that the day of radical operation will soon be past, that it will no longer be necessary to send children thus affected for prolonged periods to the seaside, and that the unsightly scars which disfigure the necks of so many girls can now be avoided. Radium is, if properly used, a safe and as far as he can see a certain cure, whether for an early or an advanced case of tuberculous glands. Within the period named he has treated between twenty and thirty cases of every grade with radium. In every case the swellings and even old sinuses faded away. Unless there were already sinuses present, no scars were left. The skin was in some a little red for a few weeks from the action of the radium, but this always disappeared.

In no case was any ulceration caused. It is unnecessary to describe all the initial experiments and the doses used. As a result he finds as follows:

Fifteen milligrammes of radium bromide, spread out on a flat circular applicator 1¼ inches in diameter, and mixed with a special varnish to keep it even and prevent loss, is sufficient for this kind of treatment. The applicator has a screen of silver 1 mm. thick, and a piece of thin gutta-percha tissue tied over the whole to prevent soiling of the radium. The applicator is strapped on over the tuberculous glands. He has found ten hours a suitable time for each application of the above strength—that is, 150 milligramme hours. The applicator is applied when the patient goes to bed, and taken off in the morning. A different gland or group of glands can be attacked at each sitting till all have been covered, and the course then started again.

The patients usually have had two applications a week. Nothing was noticed for from a week to ten days, but from that time a gradual shrinkage of the glands was observed till nothing could be felt except a few fibrous nodules. He continues the treatment till all signs of trouble have disappeared. In very bad cases he usually gave in addition a few applications three months later, but doubts whether this is really necessary if the first treatment is properly carried out.

Since his demobilization from the R. A. M. C. he has had an opportunity of inspecting many of the patients he treated in 1913-14. In none of them can he find a trace of any further trouble, nor has he heard of any that he has not actually seen having any signs of recurrence. Evidently, therefore, the cure is usually a lasting one. Should a case recur, he has no doubt that a further course of treatment would restore the patient to health again.

THE QUESTION OF CHOLECYSTECTOMY.

The *Medical Record* of November 8, 1919, in an editorial on this subject says it is no longer true that surgeons hesitate to remove the gall-bladder on the pretext that this organ possesses a distinct physiological function. The number of cholecystectomies has singularly increased with improved technique, likewise there has been a great decrease in the mortality percentage. There are unquestionably some able men like Kocher, Mayo Robson, and others who are opposed to removal of the gall-bladder, but nevertheless it seems only

logical to remove a seriously pathologically changed organ, and also when it contains calculi which are only waiting for a chance to go further in the biliary tract and there set up other complications. Cholecystectomy would seem to be an ideal operation if, besides the mechanical phenomena caused by the presence of the stones, it were not necessary to take infection of the gall-bladder and biliary tract into consideration. In order to deal with this infection, drainage of the gall-bladder has appeared to be an excellent means. If there is infection of the main portion of the bile passages they must be put at rest, but it is none the less true that when the gall-bladder is alone clinically and microscopically at fault, cholecystectomy is enough to cure the patient.

The indications for operation are now more precise, and the too absolute rules of former days no longer apply to cholecystitis, and while nearly everybody admits the value of choledochotomy and hepatic drainage in the treatment of a calculus lodged in the ductus choledochus and infection of the principal bile ducts, the same cannot be said as to the value of simple cholecystectomy in the treatment of biliary lithiasis. The partisans of this operation defend it with the same ardor as those who maintain that cholecystectomy alone is insufficient to obtain a cure of calculous cholecystitis and that drainage of the biliary tract should invariably be resorted to. But the number of permanent cures effected by removal of the gall-bladder is now convincing, and it would seem that the indications for this operation can at present be stated with a considerable degree of certainty.

While both physicians and surgeons agree that simple hepatic colic and angiocholitis are exclusively in the domain of medicine, and that a calculus lodged in a biliary duct is exclusively surgical, as yet no accord has been reached in respect to the treatment of calculous cholecystitis, but it seems safe teaching to say that the medical treatment of biliary lithiasis is insufficient in the case of calculous cholecystitis and that the best treatment for this lesion is cholecystectomy. This operation removes a physiologically insufficient viscus the ablation of which produces no disturbance in the organism.

Removal of the gall-bladder should be preferred to cholecystotomy in the treatment of chronic cholecystitis and should be undertaken when drainage of the gall-bladder has been done on account of an acute cholecystitis. Cholecystectomy is an excellent operation in hydropsy of the gall-bladder and in the majority of cases of cholecystitis accompanied by marked digestive disturbances. It may also bring about a cessation of the pancreatic disturbances in cases of cholecysto-pancreatitis. The operation should be completed by drainage of the principal ducts in cases of lithiasis or infection of the hepatic ducts or the ductus choledochus.

"NEW LAMPS FOR OLD" IN OBSTETRICS.

In the *British Medical Journal* of November 29, 1919, FAIRBAIRN states that although obstetrics may not have received the same stimulus from the war as medicine and surgery, the war has produced a reflex response in obstetrics scarcely less marked than the effects of its direct stimulus on medicine and surgery. The change was in process before the war, but has been greatly quickened by it. The chief stimuli seem to be:

1. The progress and the success of preventive medicine throughout the war.
2. The examination of recruits and the attention drawn to lack of physique.
3. The necessity of population not only for war but for peace production.
4. The work of women in munition factories and the problems thus raised in regard to pregnancy, lactation, and pelvic disability in relation to industrial efficiency.

The prewar and postwar changes have involved a revision of both the strategy and the tactics of obstetrics. The campaign as a whole must be regarded as starting from

conception and covering pregnancy, labor, and lying-in, and continuing through the nursing and rearing of the rising generation. The principles dominating the new strategy are those of preventive medicine; to keep the pregnant woman in health of body and mind, to see her pregnancy to a safe termination; that she runs the minimum risk of disability, and is speedily and completely restored to efficiency, able to nurse and care for her child; and finally that her child is born uninjured, healthy, and given the all-important start toward developing into an A1 physique.

This new strategy involves a change in tactics. We know little of the intrauterine period; though we are now devoting much attention to it, we have neglected it hitherto, and must await the developments that will come from increased knowledge and further experience. The greatest success in this field has been attained in the intelligence work, so that the number of unforeseen and unanticipated occurrences in labor have greatly diminished. Labor, though merely an episode in the campaign, is the cause of the greatest number of casualties, and it is here that improvement in our tactical methods is especially required. The causes of the high casualty rate are, as regards the mother: (1) infection; (2) injury; (3) nervous wear and tear; and as regards the child the first two also apply. How much can our tactics be modified to meet this high casualty rate?

1. In the first place clearly by strict adherence to the technique of surgical cleanliness. Bonney points out its success in hospital practice and its coincident lack of success in home-conducted labors, and makes out a strong case for labor being considered as a surgical operation and given the same surroundings and conditions. But there must be a change not only in the place of attack but also in the method, especially toward diminishing internal manipulations, for even in hospital practice the morbidity rate goes up with interference.

2. To avoid lacerations and their results, immediate and remote, the reign of force must be ended. The uterus does not act as it should in our ultra-sensitive community, so our new tactics should help the natural powers by lessening pain, emotional effects, and fatigue, thus lessening also the need for manipulative interference.

3. The avoidance of exhaustion during labor with adequate rest to mind and body during the puerperium and lactation will lessen nervous stress and strain. The management of the lying-in time and the importance of considering the psychological element in the patient is to be fully discussed. To keep the woman in good physical condition during this period of rest, massage and physical exercises are brought in. Here the experience gained in the war of what can be done in the way of reëducation and improving the tone of muscles has been valuable. Special exercises have been devised to improve the tone of the overstretched abdominal and perineal muscles and diminish the risk of abdominal and pelvic prolapse.

As regards the child, the conditions leading to infections of the cord and eyes are preventable, and investigations as to the cause of birth injuries, carried out by Eardley Holland and others, may lead to a great diminution in intranatal casualties.

The other great change in our methods is to rely more on nature and to give up substitutes, whether the forceps for the maternal power, or artificial food in the place of mother's milk, the latter being of immense importance in the final stage of the campaign. But that is another story, as here obstetrics branches off into pediatrics.

The general practitioner is quickly acquiring the new tactical methods, but that some of the campaigners of the old school do not find it easy was shown by some letters in the *British Medical Journal* following the publication of the report on the teaching of obstetrics. In one of them the old tactics of force and the forceps were still advocated, and the writer seemed to glory in his interference in 50 per cent of the labors he attended.

PRACTICAL THOUGHTS ON INFLUENZA.

In the *Boston Medical and Surgical Journal* of December 11, 1919, BATES states that after the treatment of 250 cases of influenza-pneumonia by the use of pooled serum from convalescent patients, there remains no doubt in his mind that when a proper diagnosis is made, and the treatment is correctly carried out, both in hospital and private practice, the course of the disease is decidedly shortened, the death-rate is at least cut in two, in cases chosen for their severity, and reduced about three-fourths in any large series in hospital practice where the cases are seen early. These conclusions are substantiated by the reports of at least 12 unprejudiced observers.

Lord in discussing Bates's paper said the necessity confronts us of trying to form a judgment whether the method is of value or not. Unfortunately, he does not believe that the question as to its value can at the present time be answered. There are, however, certain considerations which have a bearing on this matter.

There is little to guide us from analogy with other diseases. Ordinary lobar pneumonia is the nearest analogy we have, and it may be said that ordinary lobar pneumonia has nothing to do with the kind of pneumonia under discussion. Experimental studies in animals indicate that protective substances are usually but not constantly present in the blood of patients recovering from the disease. Their inconstancy and presence in positive cases only in small amounts do not suggest that a similar method of treatment applied to ordinary lobar pneumonia would be of much assistance.

In attempting to judge the merits of such a method of treatment it is easy to be misled without a control group of cases. The varying mortality from influenzal pneumonia without the serum treatment in Boston illustrates how cautious we should be. For example, data obtained from Camp Devens indicate that during the period from October 2 to October 29, there were 231 cases of pneumonia at Camp Devens and that of the number 127 (54.9 per cent) died. Of 2817 cases at Camp Devens from September 4 to October 29, 787 (27.9 per cent) died. Comparison of one series with such a group as this would suggest curative value in the serum. But returns from certain other sources indicate that during the epidemic period the mortality from bronchopneumonia in non-serum-treated groups of cases was low. Thus figures obtained in a small number of cases among the Students' Army Training Corps at Harvard show that in 46 cases with the physical signs of bronchopneumonia, and about 15 more with questionable bronchopneumonia, there were only five deaths, a mortality of 8.1 per cent. No reliable statistics are available for the civilian community; but reports from certain individual physicians practicing in this neighborhood suggest that the mortality from bronchopneumonia may be even lower than this. Thus one physician reports only one death from bronchopneumonia, and that in a patient with mitral stenosis, among about 25 cases. Another had no deaths in about 15 cases. A third had only one death, and that in a pregnant woman, in about ten cases; and a fourth no deaths in eleven cases. In this civilian group of about 61 cases only two died, a mortality of 3.2 per cent.

He has had too small a group of serum-treated cases at the Massachusetts General Hospital to draw any definite conclusion. They treated 23 cases with the convalescent serum and lost six out of this group. At the same time they had 25 controls, and of these they lost only three. There may have been extenuating circumstances among the treated cases, but that is what they have to show, and only mortality counts.

Locke in discussing the paper said he was extremely interested in the work which Redden and Maguire had been doing with convalescent serum in cases of influenza with pneumonia, and in private cases had been much impressed with the apparent excellent results of its use. In a small

series of fifteen private cases treated during the past fall and winter his experience seemed so favorable that he felt there could be no question of the value of this method of treatment of influenza pneumonia. He confesses to the same feeling also that Lord expressed, namely, that if he had the disease he should wish the serum administered. It is difficult, however, to explain the apparent good results on scientific grounds, and personal impressions are not sufficient to prove its value.

Early in February a special service for influenza cases was established at the Boston City Hospital, and thus afforded an unusual opportunity to test the effects of the serum from convalescent cases on a series of patients suffering from pneumonia with influenza. In order to make the test as accurate as possible for each case given this treatment he used a simultaneous control. In other words, in every instance he selected two comparable cases so far as age, duration, type of disease, etc., was concerned, administering serum to one and not the other. Redden's method of preparation and administration of the serum was followed exactly. Blood was taken only from those convalescing from a severe and typical attack of influenza pneumonia, and only pooled serum was employed. Although the clinic was a large one the patients were seldom admitted previous to the fourth or fifth day of their pneumonia, and in consequence it was possible to select but a relatively small series of cases in sufficiently early stages of the disease to be considered favorable for treatment. In all, 22 cases have been treated and controlled by a similar number of untreated cases.

Their results have been entirely negative. In each group there were ten deaths, or a mortality of approximately forty-five per cent. Apart from these figures he had seen no results in individual cases which were in any way convincing. A careful study of the charts of these cases and their controls failed to show any advantage whatsoever in favor of the treated cases. No unfavorable symptoms have ever appeared following the injection of the serum, and so far as he is able to judge, the procedure is entirely free from danger of any sort.

It is unfortunate that the group of cases studied is such a small one, but even so small a number as twenty-two, with controls, is of more value in testing the merits of this method of treatment than many hundreds of cases without controls. It would seem inevitable also that were the use of the serum of as much importance as Redden's figures indicate, even in so small a series favorable results would have been very evident.

Locke does not feel justified from so limited an experience in condemning the treatment with convalescent serum as without merit. He can only say that thus far he has been unable to demonstrate any.

THE TREATMENT OF BILHARZIASIS.

In the *Proceedings of the Royal Society of Medicine* for November, 1919, FAIRLEY states the fact that *Bilharzia hæmatobia* and *Bilharzia Mansoni* inhabit the vascular system only and are incapable of living elsewhere in the tissues of the host, and strongly indicates that the venous route for the administration of any drug will yield the best results.

Several different observers have appreciated this fact, and a number of drugs, including perchloride of mercury, salvarsan, and eusol, have been given intravenously in bilharziasis. The only known remedy of importance, however, is tartar emetic. This drug was apparently first used in the treatment of bilharziasis by McDonagh, but Christopherson quite independently proved its value, and to him we are indebted for the demonstration on a large scale of the beneficial results following its administration. Since his original publication a number of competent workers, including Newlove, Innes, Low, and Newman, have reported favorably on tartar emetic treatment. Christopherson

claims that tartar emetic not only kills the parasites Bilharzia Mansoni and Bilharzia hæmatobia *in situ*, but later kills the miracidia in the ova deposited in the tissues of man.

The indices of cure adopted by these different observers have been as follows: First, improvement in the general health of the patient and disappearance of vesical symptoms; secondly, the disappearance of ova in the excreta or the passage of ova containing only dead miracidia. Observations on the eosinophilia have also been made, and observers appear agreed that during treatment a rise in the eosinophilia ensues.

In order to obtain additional data as to the value of the treatment a critical investigation was made in three cases in May, June, and July, the treatment being controlled not only by the above mentioned observations, but in addition by investigations of the cystoscopical appearances of the bladder, and of the complement-deviation reactions before and after treatment.

The most severe case received a total dosage of 50 grs. of tartar emetic; the other two cases received 30 grs. each. The initial dosage employed was ½ gr. dissolved in 10 Cc. of saline solution (0.85 per cent), and thereafter the dose was increased by amounts of ½ gr. until the physiological limit of tolerance was reached. This point was estimated by the amount of the drug which produced paroxysmal coughing and vomiting immediately after injection; it was decided to give slightly smaller doses than this. The amount of each single injection varied from 2 to 3 grs. in different cases, and was administered every second day, at a period of at least two hours after the last meal.

During treatment all the patients lost considerable weight (7 to 14 pounds); they did not feel well and were easily tired. One case had an occasional evening temperature. In all cases, however, after the cessation of treatment, the general condition rapidly improved and normal weight was established. No local effect follows the intravenous injection unless the fluid escapes into the perivenous tissues, when a severe local inflammatory reaction may supervene. In one case only was such a result observed. Local induration, swelling and tenderness were present, but this condition subsided in four days.

[These doses of tartar emetic strike one as being very large, particularly if given intravenously.—ED.]

VALVULAR DISEASE OF THE HEART.

In the *Albany Medical Annals* for December, 1919, MCKENZIE states that edema may result from the failure of compensation, both in the right and left heart. With this present in only a mild degree he advises that we put the patient to bed and give tincture of digitalis, twenty minims t. i. d., preceded by calomel. When the edema is great, causing dropsy, several different treatments may be used: The calomel treatment, which consists in giving three grains of calomel three times a day for three days. One will not get more than four to six bowel movements, but will get very marked effects on the kidneys. In giving this treatment one must use every hour a mouth-wash of potassium permanganate, one to one thousand, and give five grains of sodium bicarbonate with each dose of calomel to prevent ptyalism. The calomel treatment does not work so well after the dropsy has recurred three or four times.

In children the same treatment may be used, giving the calomel in one-and-one-half-grain doses. There is only one contraindication for this treatment, and that is a chronic nephritis of the parenchymatous type where there is much albumin and many casts.

Any heart patient of long standing will show albumin in the urine, and this should not be mistaken for nephritis, hence calomel should be used if only traces of albumin in the urine are observed.

The second method, indicated in extreme cases: Take six grains of calomel, three drachms of compound jalap powder, and three-tenths of a grain of elaterium; divide

into three powders, and give one powder every two hours till all are taken. This acts more on the bowels than on the kidneys.

The third method: This is used in cardiac or renal dropsy or a combination of both. Give diuretin in twenty-grain doses every two hours till twelve doses are given, then stop. One may use this in children in five-grain doses.

The fourth method consists in giving the Niemeyer or Tyson pill, and this contains calomel one grain, extract of squills one grain, powdered digitalis leaves one grain. Give one every three hours till twelve are taken.

The fifth method is by the use of apocynin, which is given in the so-called cymerin tablet, which is silver-coated. The dose is one or two tablets every three hours. This is a cardiac stimulant, and one does not need to use digitalis while giving this.

THE INTRASPINOUS TREATMENT OF NEUROSYPHILIS.

HUMBERT, in the *Medical Record* of November 1, 1919, states that the introduction of the intraspinous treatment of neurosyphilis a few years ago caused quite a bit of restlessness among members of the profession. This has now subsided sufficiently to permit an unbiased consideration of the subject.

In order to ascertain in detail not only results, but the technique used, a circular letter was sent to some of the leading workers of the country. Thirty replies were received. They are considered briefly.

Question 1. Do you use salvarsan? Yes, 100 per cent.

2. How often? Answers varied from every four days to every six weeks.

3. Which brand? Availability and price seemed to govern the choice. After giving about one thousand injections of the various brands Humbert has been unable to determine much difference either as to toxicity or therapeutic value.

4. Do you use mercury? Yes, 100 per cent.

5. Mode of administration? Intramuscular, 90 per cent; inunctions, 10 per cent; 30 per cent also added it to the serum.

6. Do you use intraspinous injections of serum? Yes, 60 per cent.

7. How often do you inject the serum? Answers varied from every four days to every six weeks.

8. What do you add to the serum? Thirty per cent added mercury; 60 per cent used autosalvarsanized serum; 60 per cent tapped the spine at regular intervals. One of our leading syphilographers adds the salvarsan to the cerebrospinal fluid.

9. What results have you gotten from your method? Good, 70 per cent.

10. What do you consider improvement? Ninety per cent clinical and serological; 2 per cent serological only; 8 per cent clinical only.

Humbert believes the answers to the above circular letter tend to show a need for standardization along definite scientific lines as near as such can be done. The patient who gets plain serum intraspinously every six weeks cannot be said to be getting the same treatment as the one who gets salvarsanized serum every four days. Neither is the one who receives salvarsan added to the cerebrospinal fluid getting the same treatment as the one who has spinal drainage routinely and mercurialized serum. Differences in treatment make possible differences in results. He is convinced that this is, in part, the cause of the conflicting results equally enthusiastically reported.

The method used by Humbert is based on the following observations:

1. Barabat has shown that thirty minutes after the administration of 0.4 gm. of salvarsan, 75 per cent is taken up by the body cells. Further, the serum contains five times as much arsenic as the clot.

2. The amount of salvarsan in the serum injected is too small to be of any value. It is the serum—immune bodies and foreign protein—that does the work.

3. Serum from blood drawn during the "reaction" is more toxic to typhoid fever organisms than that drawn at other times. He has observed in a few instances that the blood did not coagulate after with-

drawal. The patient did not have hemorrhage from the puncture.

4. Akatsu and Noguchi have shown that the treponema pallidum can increase its tolerance to salvarsan 5½ times and to bichloride 35 to 75 times if we use these drugs in increasing amounts in media.

Massive doses of one drug with sudden shifts to others in order to prevent the organisms from gaining a tolerance is the object sought. The patient is placed on the table, salvarsan is made ready, then spinal drainage is instituted. This decreases the already increased pressure in the cerebrospinal fluid, permitting both mechanical and physiological passage of the drug through the choroid plexus and meninges before it is taken up by the body cells. The salvarsan is now administered intravenously. Wait a reasonable length of time for the "reaction." If it occurs draw off the blood then; if not, draw it off just the same and administer the serum intraspinally in the usual manner. The circulation of the cerebrospinal fluid makes the subdural and intraventricular injections unnecessary.

Mercury is now started and rapidly pushed to the limit. Inunction, in his opinion, is the mode of administration giving best results and causing no pain. The patients who are able are lined up in a circle; each rubs the one in front. There is a mistaken idea among too many physicians that in order to get the effects of mercury a few teeth, and occasionally portions of the mandible, must go. This is nothing short of malpractice. When there is evidence of salivation the blood is drawn and mercurialized serum is administered. The procedure is repeated until desired results are accomplished. The administration of iron, quinine, and strychnine tends to ward off the bad effects of the treatment. Throughout the course of treatment intraspinous injections are administered as often as shifts to the other drug are indicated, provided the physical condition of the patient permits.

The number of his cases treated thus far are not ready for report. Results, however, have been so satisfactory that he feels a preliminary statement justifiable. Many men object to this treatment on grounds that it is too drastic for the patient. It is not nearly so much so as the inevitable results otherwise. The statement that the intraspinous treatment possesses nothing superior to the time-honored intensive method is not borne out by experimental or clinical data.

ANTISCORBUTIC VALUE OF COW'S MILK.

The *British Medical Journal* of November 22, 1919, in an editorial refers to the investigations at the Lister Institute on this subject by Barnes and Hume, in which they describe their experiments on the relative antiscorbutic value of fresh, dried, and heated cow's milk. Previous observations had shown that raw cow's milk, though it possesses antiscorbutic properties, is much less valuable in this respect than many raw fruits and vegetables; for example, whereas 1.5 to 10 grammes daily of these vegetables will protect guinea-pigs from scurvy on a diet otherwise devoid of all antiscorbutic material, 100 to 150 Cc. of raw cow's milk was required to give similar protection.

As dried milk is being used for the feeding of infants to an increasing extent, and has definite advantages in convenience and its freedom from the risk of tuberculosis and other infections, it is important to determine if its antiscorbutic and nutritive values are lower than those of raw milk. Clinically some infant specialists have never seen scurvy as a result of feeding with dry milk; but Barnes' and Hume's experiments on guinea-pigs and young monkeys prove quite definitely that dried milk is markedly deficient in antiscorbutic value as compared with raw cow's milk. Sir T. Barlow ascribed the subperiosteal hemorrhage in infantile scurvy to increased vascularity of the periosteum, but post-mortem examinations of slight and incipient scurvy in monkeys suggest that the bone becomes rarefied at an early stage of the disease, and that the blood oozes outwards, presum-

ably from hemorrhage into the bone-marrow. Rapidly scalding milk, so as to keep it at a temperature of between 160° and 212° Fahr. for about five and a half minutes, which is commonly believed to kill the tubercle bacillus, causes comparatively little damage to the antiscorbutic vitamine. No evidence was forthcoming to suggest that the growth-promoting properties of fresh milk suffer any serious damage during the process of drying.

An interesting point—also, we believe, observed recently in the Central Empires—is the influence of the cow's fodder on the antiscorbutic value of the milk; in these experiments cow's milk had a higher value in summer than in winter, depending on the difference between fresh herbage on the one hand, and hay, oil-cake, cereals, and roots, especially if the roots are mangolds and not swedes or turnips, on the other hand. Therefore, as cow's milk is a foodstuff of inconstant value as regards its antiscorbutic properties, and as the latter are much reduced by drying, there is good reason for advocating the use of an extra antiscorbutic, such as raw orange juice and raw swede juice, in the dietary of infants fed on dried milk.

ROENTGENOLOGICAL DETERMINATION OF PULMONARY TUBERCULOSIS.

DIEMER and CRAMER in the *American Journal of the Medical Sciences* for December, 1919, state that to the uninitiated there are two pathognomonic signs of pulmonary tuberculosis:

1. Lime-salt deposits in the upper quadrants, which do not necessarily indicate activity.

2. The cavity which indicates activity in the large percentage of cases.

Calcification areas, wherever located in the lung, in the vast majority of cases indicate that at some time there has been an active tuberculous process, but those of the lower quadrants are rather incidental, as healing usually takes place and the process stops at the bronchial glands. In the upper quadrants they indicate that the patient has a true, dangerous tuberculous infection which is either healed, quiescent, or more or less active. If in addition there are indications of fibrosis, with no emphysema and little or no mediastinal or chest-wall retraction, activity is indicated. If clear, irregular emphysematous areas are interspersed, with more or less retraction, and the calcification areas are clear-cut and uniformly dense, the process is probably quiescent, chronic, inactive, or healed. Differentiation from lues, the fungi infections and the pneumonias can be made without difficulty, but only after observing many cases.

Excavations are unmistakable if studied by both plates and screen. Activity is at once established, the differentiation from non-tuberculous lung abscesses presenting no very great difficulty. The tuberculous cavities, except in a very small percentage, are found high in the upper quadrants and are often multiple or bilateral, while lung abscesses are practically always found in the body of a lobe and seldom multiple or bilateral. In their series four cases presented tuberculous excavations in the lower lobes. Three cases of multiple pulmonary abscesses were detected in a series of over 2000 cases of pneumonia studied by roentgen rays. These abscesses were either filled with broken-down, semisolid tissue or with pus, the patients not living sufficient time to establish drainage or for air to collect above the fluid level. Lung abscesses invariably in a few days present a collection of air above the fluid level. The same is true of tuberculous cavities, but the surrounding lung shows unmistakable evidence of peribronchial thickening, fibrosis, and other signs of tuberculosis, depending upon the stage of the process. A non-tuberculous cavity tends to heal if adequate drainage is established, and is seldom seen empty, while the tuberculous cavity does not as often completely heal and is usually empty.

Other conditions to a less degree pathognomonic are as follows: Fibrosis, retraction of the trachea, mediastinal con-

tents, heart and chest wall, a decided lack of illumination of one or both upper quadrants on deep inspiration or coughing before the screen, and a lessened radiability, either uniform or delicately mottled on the plate; abnormal presentation in the upper quadrants if there is a hanging, "dropped," or very small heart silhouette; or if the diaphragm on the corresponding side is in partial expiratory position or its excursion is impaired on deep inspiration. Any abnormality found in the upper quadrants should cause the roentgenologist to suggest the probability of tuberculosis unless definite indications of another process are certain.

An interesting phenomenon seen in the more chronic emaciated cases is the difference in radiability of the pectoralis muscles, those on the affected side not being so dense and distinct.

THE GENERAL TREATMENT OF INFLUENZA.

In the *Medical Record* of October 25, 1919, BARNES states that the initial symptoms are usually well met with the old-fashioned pulvis ipecacuanhæ et opii. The cough, the pain, the restlessness, if present, are thus relieved, and the fever and circulatory unbalance benefited by the diaphoresis. Codeine or heroin and ammonium salicylate may be substituted. He believes calomel and phenolphthalein, or sodium phosphate, do all that castor oil will do, and are not so illy received by the stomach. The belladonna group comes in for recommendation for dyspnea and cyanosis, and gives better results than most of the other drugs used to combat these symptoms. Inhalation of oxygen passed through warm alcohol gives relief. Digitalis, strychnine, caffeine, camphor, and whisky have their advocates in combating the circulatory failure, but in this last epidemic Barnes admits that he was disappointed in their action. Pituitrin, especially for abdominal distention, has proven of value. Sodium barbital or sodium bromide are the hypnotics of choice. Calcium iodide in small doses has decided advantages over the so-called stimulating and nauseating expectorants. Hexamethylenamine should be given at intervals or continuously in small doses.

The fever in uncomplicated cases seldom needs attention. The elevation may be sharp, but the duration is short, and we are coming to look upon this symptom as did Sydenham when he observed, over two hundred and fifty years ago, that "fever is nature's engine to burn up infection." Hyperpyrexia can be met by hydrotherapy, which likewise relieves the nervous symptoms. Precautions against chilling the surface of the body and cooling the extremities should always be observed.

Local medication is useful, and may be summarized as follows: Boric acid or argyrol, in aqueous solutions, for eyes and nose. Sodium chloride and bicarbonate, in aqueous solution, for nose and throat wash. Tincture of benzoin compound in vapor inhalations, or 2-per-cent menthol and chloretone in liquid petrolatum by nebulizer, for irritations of the air-passages. Counter-irritants, as equal parts of olive, amber, and clove oils, are indicated for chest and back pains, and menthol preparations for head and neck pains.

The various types of the disease depend upon the location of toxins and accompanying inflammations. From otitis media and mania to gastroenteritis and arthritis the treatment should be to meet the indications as they arise, and never lose sight of the patient in the endeavor to eradicate the disease and its complications.

Barnes says there are a few negative phases in the treatment which are equally important, viz.: Do not allow patients to regard drugs and the disease so lightly as to be constantly prescribing for themselves. Do not allow them to be misled by the usual idiotic treatment appearing in the press, which is generally to advertise somebody or something. Do not allow them to use strong and irritating gargles that remove the protecting mucus and leave a reddened and unprotected membrane; cold water gargles are better. Teach them to

treat the mucous membranes kindly. Do not allow them to walk around with a fever; put them to bed, and do not allow them to get from under the covers until the danger from their infection is past. Do not give coal-tar derivatives or other depressing drugs; the disease is depressing enough without adding this therapeutic insult.

Regardless of any therapy instituted in the treatment of those stricken with influenza of the type experienced during the past year, the one essential measure is rest, absolute, prolonged rest in bed.

TREATMENT OF THE CHRONIC DISCHARGING EAR.

BLACKWELL, in the *New York Medical Journal* of December 6, 1919, states that when considering any remedial measures for chronic otorrhea, we must bear in mind its possible effect not only in stopping the discharge but also upon the patient's hearing. In the non-operative cases this is especially true, as usually the hearing is quite good and becomes the main question at issue, at least in the eyes of the patient, who often regards the discharge of little or no consequence.

If it was possible to sum up in a phrase the treatment of chronic otorrhea it should be "aeration of the middle ear." The tympanic cavity should have free access to the air, both externally by way of the auditory canal and internally by way of the Eustachian tube.

Granulation tissue when present in the canal in the form of aural polyps must always be removed as preliminary to any treatment. When the middle ear appears to contain granulation tissue alcohol may be instilled into the canal at the conclusion of the cleansing and the head held on the side for a few moments until it can act in the tympanum. If the perforation in the drumhead be sufficiently large applications of silver nitrate of mild strength to the tympanum may be beneficial. The auditory canal must be kept free of pus and dry at all times. When the discharge is profuse this can be accomplished by irrigations. Boric acid is best for this purpose, a rubber ball syringe being used with only two ounces or so of solution at each irrigation, and repeated as often as is necessary to free the canal of pus. At the conclusion of each irrigation the canal must be thoroughly dried. Absorbent cotton should never be worn in the meatus except in the most severe weather, and as the discharge diminishes the number of irrigations can be lessened, until finally as it becomes comparatively scanty they should be terminated. At this stage the pus is best removed from the canal by means of a cotton applicator, and as it is not usually feasible for a patient to receive the constant attention of a physician or nurse it can be effectively performed by himself in the following manner:

A small bit of absorbent cotton is tightly twisted about the square end of a match, thoroughly covering and protecting the sharp corners and edges. The arm opposite the affected ear is passed over the head and with the same hand the edge of the auricle is grasped and pulled upward and backward, the other hand carefully inserting the cotton-wound end of the match down to the bottom of the canal, rotating it gently. This procedure should not be accompanied by pain, and a few demonstrations will convince the patient of its safety. The capillary attraction of the fibrils of the cotton will not only free the canal of moisture, but the middle ear as well. It should be repeated as often as necessary to dry the canal. Prior to irrigation or drying the canal the instillation of a few drops of hydrogen peroxide followed by rapid opening and closing of the meatus for a few times will be found to be helpful in removing a thick tenacious discharge. When the discharge becomes slight the occasional insufflation of boric acid powder in small quantities is indicated.

Aeration of the middle ear by way of the Eustachian tube is quite as important as external aeration. The author does not believe in the practice of closing the Eustachian tube when treating these patients;

he would recommend that procedure only when the radical mastoid operation is performed. The best functional and surgical results he believes are obtained by retaining the patency of the tube. Occasional inflation of the tube may be practiced. Deflected septa sufficiently marked to cause nasal obstruction should be corrected. Nasal polyps if present must be removed; all diseased conditions of the accessory sinuses of the nose treated, and, if necessary, operated upon; enlarged or diseased tonsils should be removed, together with adenoids if any exist, particularly in the case of children, and the nose should be perfectly free and clean.

Persons with chronic otorrhea are likely to become accustomed to their affliction and take the discharge more or less as a matter of course. Frequently they assert that the canal has been regularly and properly cleansed. On interrogation, however, and closer examination, it is evident that the cleansing of the canal must have been performed in a most desultory manner. Only a full realization of the serious consequences sometimes attending this complaint will arouse the patients to the importance of implicitly following the instructions given. Both physician and patient should remember that the successful outcome of treatment for chronic otorrhea depends largely upon the thorough, consistent and regular manner with which the patient removes the pus from the canal and constantly keeps it not only clean but dry.

THERAPEUTICS IN ASPIDOSPERMA.

Wilcox, in the *Medical Record* of October 25, 1919, states this drug is a valuable remedy when the respiration is embarrassed, as in emphysema, chronic bronchitis, or chronic pneumonia; in many instances the relief is almost immediate. Given in proper doses it relieves not only the dyspnea but also the cyanosis and sense of suffocation. It appears to assist the oxygenation of the blood as well as to stimulate the respiratory center. Aspidospermine represents fairly well the activity of the drug with the furtner advantage that it may be used hypodermically in dose of one-half grain (0.03 gm.).

It may relieve symptomatic asthma when due to uremic conditions, and possibly when arising from cardiac failure. When dyspnea is due to cardiac hypertrophy relief is more certain not only because of the depressant effect of the remedy upon the cardiac musculature, but as well because of its action upon that part of the nervous system which governs respiratory movements, and its influence may even extend to the cardiac innervation. The asthmatic symptoms of secondary anemia are often markedly relieved because it is believed that the remedy increases the power of the hemoglobin to take up oxygen, although it is not explained in what way this may be accomplished. It is probable, however, that when asthma is not symptomatic of serious organic lesion, the effects of the remedy will be constant and satisfactory. Usually its use is not so satisfactory during the paroxysms as are other remedies. It is not curative, but it possesses a marked action in preventing a recurrence of the attacks. After its administration there is usually a feeling of warmth in the head, some perspiration, and frequently slight salivation. The dose of the fluid extract required for this purpose is from ½ to 1 teaspoonful (2 to 4 mils) every two to four hours, but if long continued it is likely to cause nausea. Prolonged administration produces no alterations in other functions or organs excepting such as have been noted above.

While we must concede that the effect of the remedy upon respiration is unique, he is not prepared to advocate the use of it for the dyspnea of mitral insufficiency, unless that lesion were well compensated by cardiac hypertrophy. Nor indeed can we go so far as to call it the "digitalis of the lungs" in that it relieves dyspnea whether from purely nervous disorders or when due to anatomical alterations in the respiratory or circulatory apparatus.

There is no doubt that aspidosperma is a valuable remedy for the relief of some instances of disease in which dyspnea is a

persistent and important symptom, but its employment is largely empirical, in spite of the valuable and important work of our own Wood. In order that its logical uses and its limitations may be determined, the pharmacology of its various alkaloids must be worked out in the chemical and physiological laboratories, and it must be employed in actual practice upon patients in order that it may be used with confidence and we may be certain of obtaining uniformly satisfactory results.

Forty years of clinical observations have established the value of the remedy so that it has been properly admitted to the Pharmacopœia. Personally Wilcox has often obtained brilliant results from its administration, and occasionally equally inexplicable failures.

THE PRESENT STATUS OF VACCINATION AGAINST INFLUENZA.

STEWART, in the *Medical Record* of October 25, 1919, asserts that the present status of vaccination against influenza may be fairly stated to be as follows:

The recent pandemic of so-called influenza was due to an undetermined "influence" that lowered the resistance of the body as a whole and of the respiratory organs in particular.

The Pfeiffer bacillus is regarded by some authorities as the primary infective agent, while others assign to it a secondary rôle as contributing to the clinical manifestations or complications.

Whether or not the influenza bacillus of Pfeiffer plays the rôle of a primary or secondary infective agent, the fact remains that the following bacteria are considered mainly responsible for the pneumonia and high death-rate which accompanied the pandemic of influenza. This group consists of the Bacillus influenzæ of Pfeiffer, different types of the pneumococcus, and different varieties of the streptococcus, the staphylococcus albus and aureus, and the micrococcus catarrhalis group. Sometimes other kinds of bacteria take part in the infection.

This group of bacteria is also responsible for the various infectious respiratory diseases known under different names, depending upon the anatomical structures attacked. Thus we have the terms coryza, cold in the head, influenza, tonsillitis, bronchitis, pneumonitis, lobar pneumonia, bronchopneumonia, etc.

According to the evidence above cited, vaccination against these several so-called respiratory diseases has proved of decided efficiency both for prevention and treatment. This evidence was accumulated by competent observers during the prevalence of the influenza epidemic in the army, navy, great industrial institutions, and in private practice, both in this country and abroad, during the great war.

Failures may result unless proper care is exercised in preparing the vaccine. A highly multivalent mixture vaccine prepared from numerous virulent strains of the bacteria comprising the group responsible for the respiratory diseases should be employed. Early failures were largely due to the employment of a vaccine prepared from the Pfeiffer bacillus alone, later failures to the use of a combination of this bacillus with the pneumococcus. Subsequent successes with vaccine prepared from the whole group demonstrated a greater efficiency.

LIPOVACCINES.

In the *Medical Record* of October 25, 1919, HITCHENS concludes that the development of lipovaccines constitutes an important advance in the means by which infectious diseases may be prevented.

Oil vaccines to be of greatest value should be permanent suspensions.

Since such vaccines make it possible to administer relatively enormous doses without severe reactions it is possible to immunize against infections by the injection of a single dose.

Such vaccines do not undergo rapid deterioration and their content in bacterial protein may be accurately standardized.

Methods for preserving them against

contamination, and for examining them for sterility and potency, are still under investigation.

The record they have made already in the prevention of the typhoid fevers and the infections caused by the fixed types of the pneumococcus demands that the essential work yet undone be expedited as much as possible.

SEVERE ANAPHYLAXIS: RECOVERY.

MUNRO, in the *British Medical Journal* of November 22, 1919, states that the fatal case of anaphylaxis after diphtheria antitoxin recorded in the *British Medical Journal* of November 8 prompts him to record an equally severe case with recovery.

The patient was a man suffering from compound fracture of the tibia. He had the usual doses of antitetanic serum, and so had been rendered sensitive to horse serum. When seen by Munro on August 23, 1919, he was suffering from erysipelas spreading from the wound and a spreading bronchopneumonia. His condition was critical, and it was decided to give him 30 Cc. of polyvalent antistreptococcal serum intravenously. This was diluted in saline, but no effort was made to desensitize the patient before administration. Within a minute after the injection he complained that he was choking, grasped his larynx, and breathed jerkily and spasmodically. He became cyanosed at once, his lips, cheeks, and neck assuming almost a black color, and the pulse was flickering; breathing ceased in full inspiration.

The foot of the bed was raised immediately, and artificial respiration commenced by forcibly pressing in the lower ribs, whilst the mouth was cleared of much mucus by the nurse. He decided to try and relieve the spasm by making him take in any air which could be got in through a chloroform mask. A nurse held the mask, fairly well saturated with chloroform, over his mouth and nose whilst he continued to try and force in his chest, thereby getting a little air in with a mixture of chloroform. At the same time he was given 30 minims of adrenalin solution and atropine 1/100 grain subcutaneously. Very soon the chloroform began to have its effect, for in about five minutes the patient breathed, and when fully under the anesthetic breathed normally. The cyanosis disappeared and the pulse returned; when counted it was 150 to the minute and of very low tension.

About one hour later the patient was comparatively well, and the next morning the desired effect from the serum was manifest; the general condition was much improved, and the temperature and pulse only a little above normal. He eventually made an excellent recovery.

The decision to try chloroform in a man who was apparently dying seemed a bold one, but when it is remembered that death occurs from anaphylaxis with the chest in full inspiration, and that the condition appears to be a spasm of muscle fibers in the fine bronchi, there seemed only one thing to be done, and that was to try and relieve the spasm by an anesthetic. It should also be remembered that it is not possible to produce anaphylaxis in an animal while it is under the influence of ether.

The death recorded on November 8 was after the administration of diphtheria antitoxin given as a prophylactic. Is this advisable? (1) May not this first dose render the child sensitive to horse serum, and risk a catastrophe should it require a horse serum at any future date? (2) Diphtheria antitoxin is antitoxic, and not antimicrobic.

ABSCESS OF THE LUNG FOLLOWING TONSILLECTOMY.

BURGEN, in the *British Medical Journal* (Epitome) of November 29, 1919, in a review of the literature of this subject, states that about forty cases have been recorded, all of them in America; thirty-two have occurred in adults and only six in children. In all but one case, in which local anesthesia was used, ether was given as a general anesthetic. Burgen comes to the conclusion that the fear of abscess of the lung need not act as a deterrent when ton-

sillectomy is indicated, provided that it is performed by a skilful operator and with all the necessary precautions, which include (1) treatment and rest in bed for a few days after the operation; (2) local anesthesia in older children and adults; (3) special care in the administration of a general anesthetic in the case of young children. Under these conditions the danger of pulmonary abscess is extremely slight.

SLOUGHING DUE TO A MUSTARD POULTICE.

The *Medical Record* of December 6, 1919, in an editorial states that the familiar mustard plaster or poultice is believed at the most to be a vesicant. It is conceivable, however, that under unusual circumstances a deeper or more intensive action might be forthcoming; for example, in a cachectic infant or on a paralyzed limb, but in practice there is little likelihood of the application of mustard under such circumstances.

A case narrated by Jourdannet of Uriage in the *Journal de médecine et de chirurgie pratiques* of September 25, 1919, shows that accidents from this simple resource can occur if the conditions are favorable. The patient was a lad of twelve who was suffering from grippe with a suggestion of pulmonary complication. The poultice was supposedly of flaxseed with mustard addition; it was applied over the back of the chest and left in place one hour (although the boy complained of the unpleasant sensation). When it was taken off the skin showed a lively red and was dusted with talcum. It was not until a fortnight had elapsed that the boy, who complained of his back, was found to be suffering from multiple ulceration at the site of the poultice. There were several gangrenous areas which suppurated freely and were very painful. It was not easy to determine exactly what had occurred, but so far as could be ascertained the application had actually consisted of pure mustard flour instead of flaxseed mixed with the irritant. Healing under soothing measures occurred very slowly, and once there was a reopening of some of the lesions. Three months were required for complete cicatrization. The entire experience was unusual, especially the recrudescence of ulceration in the affected area.

AMBULATORY DIET CURE FOR PEPTIC ULCER.

Weiss, in the *Medical Record* of November 29, 1919, states there are always a certain number of patients in whom the symptoms are very suggestive of chronic ulcer, but in whom the diagnosis is not sufficiently certain, or for one reason or another the patients will not or cannot give the time for a regular course of treatment in bed. In these cases it is advisable to put them on a bland diet which has sufficient food value to keep up the strength, which combines well with the usual large excess of free hydrochloric acid, and which is obtainable almost everywhere. If the case is actually one of gastric or duodenal ulcer, unless the changes are very great, at least there will be decided temporary relief, sometimes for a year or more, and in a few cases, particularly if persisted in for three or four weeks, he has seen clinical cures. The diet also is of considerable diagnostic value, as the case which is clinically ulcer, but does not get very great or complete temporary relief for weeks or longer, is very probably not ulcer but chronic appendicitis, gall-bladder disease, or something else which simulates ulcer.

The diet for these ambulatory cases is planned as follows: For two or more weeks they take at 8 A.M., 1 and 7 P.M. two glasses of milk and two soft-boiled eggs without salt at first. At 11 A.M., 4 and 10 P.M., one and a half glasses of milk, and about 16 ounces of cream during the day.

After the two weeks are up, or later in severe cases, one can add fine well-cooked cereals, custards, gruels, cream soups, soft toast; and still later boiled fish, etc.

One does not expect to get the best results with this diet, and it should not be advised unless the patient refuses for one reason or another to take a full course of diet with rest in bed. Vichy is the best

form in which to take water between feedings, or if more alkali is indicated by much acidity, alkali powders may be given an hour or an hour and a half after the principal feedings. If the milk mixture does not seem to agree, some of the alkali may be added directly to each feeding. An occasional case has to omit the cream on account of increased gastric acidity.

He especially emphasizes the need of a good follow-up system in chronic ulcer. These ulcers are essentially chronic, and this should be carefully explained to the patient. The greatest failure he sees in medical treatment is due to the failure to follow up the cases carefully for months, and to protect the stomach from irritation for a long time.

Every ulcer is different and needs careful watching and frequent modification in treatment.

There is no such thing as ulcer treatment. We do not want to lose track of a chronic ulcer patient and have him report only when his symptoms are severe. Watch the patient with chronic ulcer and protect him from recurrence.

GONORRHEAL OTITIS IN INFANCY.

PUTZIG, in the *British Medical Journal* (Epitome) of November 29, 1919, records the following case to point his argument that the common tendency to treat suppurative conditions of the ear without a bacteriological diagnosis is deplorable. An infant, born in November, 1918, was treated for the first time a fortnight later for typical gonorrheal conjunctivitis. Complete recovery was effected in two or three weeks by specific treatment. In February, 1919, the infant developed a purulent discharge from the right ear. The tympanum was red and perforated. Only slight improvement followed irrigation with hydrogen peroxide; the discharge became thicker and more profuse, as well as fetid. Tampons soaked in alcohol, boracic acid irrigations as well as powdered boracic acid, failed to check the discharge. Then gonorrheal otitis was suspected, and typical Gram-negative cocci were found. Accordingly irrigation with protargol was prescribed, with the result that in a few days marked improvement was effected. By the middle of March the discharge had ceased and the perforation had closed. No relapse occurred. As the otitis did not develop till almost two months after the arrest of the conjunctivitis, the author suggests that it was probably not the source of the otitis. This, he suspects, was the result of direct infection from the mother.

SYPHILIS AND ITS SEROLOGICAL SIGNIFICANCE.

In the *New York Medical Journal* of December 13, 1919, KAPLAN, as a result of his experience, states that he is prepared to say that a positive Wassermann reaction is sometimes obtained repeatedly in cases without lues, that ultimately show no trace of the infection at post-mortem, and also that in some cases of syphilis salvarsan is at times contraindicated, regardless of the presence of lues and a positive Wassermann reaction. This statement may sound paradoxical to the extremists, but it is supported by cases thoroughly investigated, some of which have been published. He has seen instances where the heroic use of salvarsan could be held directly responsible for a patient's death.

It is the duty of every specialist to note the degree of involvement of a given organ and carefully estimate the amount of improvement possible without attempting to administer salvarsan or anything else *ad libitum*, and not depend upon the serologist to indicate the time when treatment is to be stopped. The ophthalmologist of experience knows to what extent an interstitial keratitis can be improved, and also knows that often the positive Wassermann reaction will continue long after this improvement has been attained. To treat such a patient until his Wassermann reaction becomes negative is at present considered poor therapeutics.

Individual susceptibility is another factor, requiring caution, a good clinical eye,

and a careful selection of the antiluetic remedy for each patient. It must be remembered that salvarsan should be given with extreme care to patients with a low blood-pressure, as the drug itself on account of the arsenic it contains tends to lower vascular tone. Exceptionally one will encounter patients who can tolerate enormous aggregate doses of the drug without any manifestations of chronic arsenical intoxication. Such measures are still in vogue when treating certain patients with neural lues, and in his opinion it is often overdone, particularly where the frequency of the injections are only a few days apart. This is usually the practice of the adherents of intensive methods, whereas equally as good results could be obtained and are actually secured with smaller doses at rarer intervals.

There are cases on record in which patients received twenty to thirty intravenous injections of salvarsan in from thirty to forty days, the physician insisting that regardless of his patient's subjective good health the treatment ought to be continued on account of the serological report. The time is ripe for a more conservative stand to be taken regarding the significance of a positive Wassermann reaction, and Kaplan questions the good judgment of the position like that above named by those insisting upon intensive treatment. Kaplan asks: Should a weakly positive Wassermann reaction be considered as a danger-signal in a patient who feels perfectly well as a result of a few injections of salvarsan? In view of our present knowledge of this phenomenon, he thinks not. Can a positive Wassermann reaction be eliminated as one would try to eliminate acetone or albumin?

Can we with any degree of certainty classify the substances responsible for this reaction among poisons specific to the activities of the spirochetes, or is it produced by other conditions and has it properties aside from those which would justify its unqualified eradication? Statistics show that in early and in some late syphilitics there is a corresponding diminution in the intensity of the positive Wassermann reaction. On the other hand, if we are still willing to adhere to Ehrlich's side-chain theory we must, *nolens volens*, regard the phenomenon of a positive Wassermann reaction as pointing to antibody formation in the patient, and as such, signficant of nature's method of combating the malady. Speaking conservatively, both contentions possess many points in their favor, and the clinician who remembers both sides is the one who will accomplish the most good for his luetic patients.

It is well known that certain diseases are not even remotely associated with syphilis, and they repeatedly give positive Wassermann reactions—for instance, scleroderma. In such cases it is impossible to remove this reaction entirely with the antiluetic remedies in vogue, regardless of the intensity of the treatment. This tends to show that a positive Wassermann reaction is specifically not an index to the existence of spirochetes in a patient. Some forms of leprosy also give a strong positive Wassermann reaction; certain liver diseases where lues could be excluded antemortem and postmortem gave a positive Wassermann result. One can obtain complete inhibition with previously tested negative sera when sufficient fresh fluid ox bile has been added to the serum. In the given dose the ox bile as a control would not inhibit hemolysis. These few instances are cited only as an introduction to a further study and as an invitation to clinicians to contribute additional data to our knowledge of syphilotherapy and serodiagnosis.

An attitude like the one stated was bound to come as the result of a blind subserviency to peremptory Germanic dicta, without an attempt to investigate the extent of the usefulness of their findings. Kaplan does not question for a moment the spirocheticidal qualities of salvarsan, nor is the Wassermann reaction devoid of merit. Both, however, used promiscuously, and in the hands of those who go more by what periodicals and books advise, will not obtain the results nor be as useful to their patients as the physician who depends upon personal bedside experience. Many physicians still

believe in the therapia sterilisans magna and continue to administer salvarsan to their patients until all traces of a positive Wassermann reaction are eliminated. It is no longer the patent who is considered, but the test-tube, and frequently the worker in the laboratory who never saw the patient decides the cessation or continuation of therapy from test-tube evidence alone. It is unnecessary to emphasize the fact that as a result of such procedure many patients came to grief, but happily not in vain, for the lesson left impressions never to be forgotten by those who were fortunate to observe them. In the beginning of the salvarsan therapy of 1911-1912 such unpleasant occurrences resulted, for a time, in a certain amount of skepticism, as evidenced by the work of Benario and others. Their voices were promptly drowned by protests from the army of therapeutists who thought they saw in "606" an ultimate eradication of syphilis. They were sadly mistaken. How to render humanity immune to the spirochete is still a future problem. To what extent syphilis can be removed from a patient depends upon the tissues involved, the extent of the damage, and the ability of the physician to discriminate between how much is due to syphilis and how much is idiosyncrasy.

CO-OPERATION BY INTERNIST AND SURGEON IN THE TREATMENT OF GRAVES'S DISEASE.

Lisser, in *Endocrinology* for October-December, 1919, concludes:

1. The treatment of exophthalmic goitre by the experienced thyroid surgeon leads most frequently to rapid and permanent cure.

2. The average non-expert surgery of Graves's disease is, however, accompanied by a heavy mortality.

3. Rest cure, certain medicines, and *x*-rays, skilfully administered, will cure some cases and improve the majority, without the help of surgery.

4. The best results are obtained by early consultation in each case between internist and surgeon, and by cordial coöperation throughout the course of treatment, whether that be purely medical, purely surgical, or combined.

5. Surgeons should not rush their patients to operation. Internists should not try medical measures too long.

PHANTASY OF IONIC MEDICATION.

The *American Journal of Electrotherapeutics and Radiology* for November, 1919, states editorially that Turrell in the leading article in the same journal has given an exposition concerning ionization which will shock many who read it. He discredits the fact of ionizated medication which has been so general since the publication of the work of Le Duc on Ionization, as he states "it is commonly held that it is possible by means of the electrical current to introduce a drug such as salicylic acid into the interior of the body, and there obtain the specific therapeutic action of that drug." This proposition Dr. Turrell emphatically denies, stating that "it is so opposed to the fundamental principles of electrochemistry that it is difficult to understand how such a theory could be so universally entertained."

The wizard Le Duc had fathered the theory and gave it more force than might otherwise have been given it. Morton had demonstrated the principles as employed in effecting local anesthesia by ionization of cocaine hydrochloride.

Faraday taught that electrolysis appeared only at the electrodes and not in the interior of the electrolyte, and how the notion that drugs were transmitted into the tissues ever dominated the minds of electrotherapeutists in this particular phase is to be explained.

Dr. Turrell shows, furthermore, that experiments had been made to counter this theory, and explains that where iodine is found in the circulation it is from skin absorption or ionization near the surface, which is carried away by the circulation and so appears in the urine. The deductions made confirm the author's premise, and his scientific presentation offers food for thought.

That the metals are ionized from the

surface and penetrate into the tissues is demonstrated by the well-known experiment of the diffusion into the meat and egg by which the oxychloride of copper is driven into the substance of the electrolyte from the positive pole. The same principle is implied in the treatment of endometritis and in malignant tumors by Massey's method of zinc mercuric ionization.

Theories which are based upon not too substantial foundations are often disproved. If this is all that can be claimed for the process, there seems very little justification for the employment of the constant current for the induction of nutrition by hyperemia when hyperemia can be induced by radiant light and heat and the high-frequency thermal penetration; because the results may be obtained without any electric action upon the tissues.

THE SUGAR TREATMENT OF TUBERCULOSIS.

STERLING, in the *Medical Record* of December 6, 1919, would advise institutions treating tuberculous patients to adopt saccharose injections as a routine therapeutic measure without fear, it being absolutely harmless. Any dependable drug store that is making ampoules for intramuscular injection can make an ampoule containing saccharose, 5 grains, in sterile distilled water, 5 Cc. The ampoule, of course, must be sterilized by the maker ready for use. Injections to be given daily or every other day. Personally he prefers the gluteal region for all subcutaneous injections. There is very little pain if one develops the art of injection medication, and if the hypodermic syringe (of 10-Cc. capacity) is heated before use, one will most likely never have an infection.

In summarizing his article he states:

1. In this series of patients with tuberculosis the subcutaneous injection of saccharose had very little if any effect upon the progress of the fever.

2. Night sweats and expectoration ceased almost immediately.

3. The reduction of the cough was not in proportion to the reduction in the expectoration, hence a dry and distressing cough might be present in the beginning, but it was more or less controlled later.

4. There was a marked gain in weight and strength with an amelioration of the toxemia and its depression.

[We fail to see how so small an amount of saccharose can have any value.—ED.]

RESULTS FROM DIFFERENT METHODS OF BLOOD TRANSFUSION.

GRAHAM, in the *Edinburgh Medical Journal* for December, 1919, sums up this matter as follows:

Direct Transfusion: (*a*) It reduces the chances of thrombosis and embolism to a minimum.

(*b*) The operation is more difficult to perform than indirect transfusion.

(*c*) The use of the radial artery is a greater sacrifice for the donor than a vein.

(*d*) The radial artery is occasionally too small for the purpose.

(*e*) The amount of blood cannot be exactly measured.

Indirect Transfusion — The use of syringes and cannulæ, with or without two-way stopcock:

(*a*) The operation is simpler than direct transfusion.

(*b*) The method demands less sacrifice from the donor.

(*c*) The operation can be more quickly performed than direct transfusion, or any other method.

(*d*) The amount of blood transfused is known.

(*e*) The risks of clotting in the apparatus can be obviated.

(*f*) Simple instruments can be improvised for the syringe method.

(*g*) The patient and donor must be brought into contact.

(*h*) The syringe method is the method of choice for infants.

Citrate Method: (*a*) Sodium citrate mixed with blood in the proportion of 0.2 per cent maintains the blood fluid for sev-

eral days. In practice it is advisable to use a stronger proportion of citrate (0.38 per cent).

(*b*) Citrated blood can be safely used several hours after preparation.

(*c*) The withdrawal and preparation of blood for transfusion is simple.

(*d*) An incision is not required to expose the donor's vein.

(*e*) There is more tendency to reaction than after transfusion with unmodified blood.

(*f*) When a reaction occurs, it does not affect the patient seriously.

(*g*) Large quantities of blood can be transfused without fear of toxic action on the part of the citrate.

(*h*) Results in shock and primary hemorrhage are as satisfactory as with unmodified blood.

(*i*) The coagulation time of the blood is temporarily shortened after transfusion with citrated blood.

(*j*) There is no risk of increasing the tendency to hemorrhage after the use of citrate of sodium.

(*k*) Unmodified blood should be preferred to the citrate of sodium method in pernicious anaemia and other diseases of the blood.

SERIOUS REACTIONS FROM THE SALVARSAN AND DIARSENOL BRANDS OF ARSPHENAMINE.

In the *Archives of Dermatology and Syphilology* for January, 1920, MOORE and FOLEY conclude their contribution as follows:

1. Four cases have been described of severe reactions to the salvarsan or diarsenol brands of arsphenamine with an unusual blood picture, characterized by leukopenia, eosinophilia, and increase in the large lymphocyte and transitional groups, together with other evidence of destruction of the bone-marrow.

2. Salvarsan evidently has both a toxic and stimulating action on the bone-marrow, and these effects are, so far as can be determined from examination of such a small number of cases, selective.

3. In a fatal case of salvarsan poisoning there was found at necropsy a markedly aplastic bone-marrow showing degenerated cells and absence of the more mature forms of the myelocytic series.

4. The fatal case showed for the first time, so far as can be determined, approximately the same kidney lesion as that produced in experimental animals by Pears and Brown.

THE NATURE AND TREATMENT OF ACNE VULGARIS.

In the *New York Medical Journal* of December 13, 1919, LEVIN states that the following instructions for home treatment are dictated to all patients: At night before going to bed wash the affected skin with hot water and soap, then with cold water and soap, and then extract as many blackheads as will come away easily. Then shake the white lotion, pour some into a saucer, and with a piece of flannel rub it well into the skin for ten minutes. After this apply more lotion and allow it to dry on over night. Several times a day wash the face with cold water and soap. Do not use powders, greases, or other cosmetics.

The hot water is advised for its cleansing and the cold water for its tonic effect. The kind of soap recommended depends upon the character of the lesions. In mild cases with only a few comedones any one of the mild commercial soaps will do: in moderately severe cases, the tincture of green soap with or without the addition of sulphur is recommended for its more cleansing, antiseptic, and peeling effect. At times a thick lather of sulphur soap allowed to remain on the skin over night enhances the exfoliation. Hand sapolio employed once or twice a week is recommended in severe cases to augment the exfoliation of the layers of horny cells and the stimulation of the atonic skin. The employment of sapolio also aids in removing comedones and opening pustules. Sulphur, ichthyol, mercury, resorcin, salicylic acid, and tar constitute the medicaments suggested for the local treatment of the condition. How-

ever, the best results are obtained by using sulphur in the form of a lotion and rarely as a cream. Fatty preparations should rarely be employed in this already over-greasy condition. Sulphur is most commonly prescribed in the following form:

Zinc sulphate, ʒj-ʒiv;
Rose water, ʒiij.

Mix and add:

Potassium sulphate, ʒj-ʒiv;
Rose water, ʒiij.

Mix.

The amount of sulphur which is added depends upon the type of lesions present. The efficiency of this lotion is increased by the addition of two drachms of milk of sulphur, and the lotion thus formed is commonly designated "compound lotio alba." If the lotions are made as indicated they should be white in color and have the odor of rose water, and not yellowish and foul smelling. Alcohol may be substituted for part of the rose water for its cooling and drying effect.

Vleminckx's solution has hastened improvement in very obstinate cases when the compound lotio alba even with the addition of resorcin had failed. When prescribing this solution detailed instructions as to the methods of preparing it should be given to the pharmacist. The sublimated sulphur, the quicklime and water should be mixed in an iron pot, boiled, and evaporation continued until 120 Cc. remain of the original 200 Cc. The disadvantages of this solution are its rapid deterioration and foul odor. It should be employed in fresh solution, a new preparation being made at least once a fortnight. Applied at first diluted one part in six parts of water, its strength is gradually increased as the skin becomes less sensitive.

When furunculous lesions develop, good results have been obtained by painting them twice a day with a ten-per-cent solution of ichthyol. When a quick local effect is imperative a forty-per-cent resorcin paste is applied until the skin is denuded and the subsequent irritation allayed by painting with Unna's zinc gelatin paste.

For the boggy and indurated masses and folliculitis of acne keloid which at times accompanies acne vulgaris the following ointment is recommended:

Sulphur ointment, ʒiij;
Red oxide of mercury ointment, ʒjss;
Zinc oxide ointment, q. s. ad ʒj.

Every case of acne is accompanied by seborrhea of the scalp, and this should be treated at the same time. In the treatment of this latter condition precautions should be observed not to use mercurial preparations excepting those containing the red oxide. All other forms of mercury combine with sulphur and produce a black pigmentation of the skin.

1. Acne vulgaris is an important manifestation of a constitutional disturbance.

2. The hyperkeratosis follows faulty carbohydrate metabolism.

3. The proper treatment of the condition demands an intelligent investigation of the general condition of the patient and the restoration to normal of any systemic derangement.

4. A reduction of the carbohydrates in the diet is of prime importance.

5. The functions of the gastrointestinal system usually require correction.

6. Arsenic is contraindicated in acne.

7. The local therapy includes all measures to remove the hyperkeratotic tissue.

8. Seborrhea is always present, and this should be treated.

ANTIPYRETICS.

Barbour and Devenis in the *Archives of Internal Medicine* for December, 1919, conclude:

1. Normal individuals usually respond to acetylsalicylic acid (1 gm. per os) by an increase in the carbon dioxide output and heat production. The maximum effect is reached during the fourth half-hour after administration.

2. The average heat production of five subjects was 40.3 calories per square meter per hour after taking the drug, as against the basal average, for these persons, of 37.8 calories; an increase of 6.1 per cent was thus indicated.

3. In spite of the increased metabolism, heat dissipation was not significantly altered.

4. During the control experiments the average change in body temperature was —0.08° C.; after the drug it was +0.03° C.

5. The respiratory quotient does not appear to be altered by the drug in normal individuals. The same is true of the pulse-rate.

6. Sleep does not appear to favor the exhibition of antipyretic action by acetyl-salicylic acid.

THE SCHICK TEST AND THE IMMUNIZATION OF CHILDREN AGAINST DIPHTHERIA.

In the *Medical Record* of November 29, 1919, PARK, in a paper before the Medical Society of the County of New York, stated that he asked for permission to make an announcement in order to let the physicians of the community know what the New York Department of Education and the Department of Health were doing in the direction of applying the Schick test and immunizing schoolchildren against diphtheria, so that when they were asked they would understand and would advise their parents to have the test made and to be immunized if that was necessary. Perhaps it was known that there had been one-third more diphtheria cases this winter than last. When this was noticed he advised the use of immunizing injections of antitoxin for the children in invaded families, and early and large doses of antitoxin for the cases of diphtheria already developed, but he especially advised the general use of the Schick test and the active immunization of all infants and children found susceptible to diphtheria. It was now known that three injections of the toxin-antitoxin would give immunity in 95 per cent of the cases, and that this immunity would develop between the fourth and twelfth week and would persist for at least 3¼ years.

It was hoped by the production of artificial immunity by the administration of the toxin-antitoxin to hasten the development of the natural immunity that took place in a large number of individuals between the age of one and twenty years. Ettinger and Copeland agreed to start with the primary and kindergarten schools to make the effort to offer this protection against diphtheria. The children would receive a statement to take home, saying that the Department of Education and the Board of Health approved of the Schick test as a means of ascertaining whether or not a child was susceptible to diphtheria, and in case a child was not immune, immunity could be conferred which would probably last throughout life by the administration of a few injections. If the parents approved of this the children would be given the Schick test and, if this showed it to be necessary, two immunizing injections. At the next term they would again be tested, and the few who were still susceptible would be given a second series of two injections. In a trial test where the parents were first appealed to and then instructed through the circulars, about 80 per cent of the children were reached. The work would be begun about May 1 in a few schools in each borough, and if the plan met with success it would be extended in the fall. It was important that physicians should understand the plan and the results, namely, that from two injections immunity could be expected in 90 to 95 per cent of the cases, which would persist at least three years. The injections were absolutely harmless. They had injected 1950 babies from three to five days old without the slightest sign of harm. The older the child the greater was the protein reaction. The reaction was more severe in adults than in children. This was due to the presence of peptones and other foreign proteins in the broth and not to the toxin-antitoxin itself.

Since about nine-tenths of all deaths occurred in children under ten years of age, it did not seem worth while to immunize the adult population, with the exception of nurses. The method of administering the toxin-antitoxin was to inject 1 Cc. subcutaneously or intramuscularly with the finest needle. Among 4000 injections given to small children, they had not had one

serious or annoying reaction. Park said he hoped that when parents asked the physician whether it was advisable to be immunized against diphtheria he would advise them to have their children submit to the Schick test and receive the immunizing doses of toxin-antitoxin if necessary. He was looking forward to a not distant time when the entire infant population would be immunized against diphtheria.

BENZYL BENZOATE.

BOICE, in the *New York Medical Journal* for December, 1919, concludes that while the results so far attained do not seem to be more than relatively conclusive, the apparent non-toxicity of this drug seems to warrant a more extended and thorough trial at the hands of the profession. Where, therefore, an antispasmodic of the opium type is indicated, for its relaxing action on the unstriped muscle fiber, Boice asks whether it would not be fair to try out benzyl benzoate in conditions such as dysmenorrhea, asthma, diarrhea, arteriosclerosis, and esophageal and pyloric strictures.

RUPTURED ESOPHAGEAL VARIX AS A CAUSE OF DEATH UNDER A. C. E.

PLAYFAIR, in the *Lancet* of December 13, 1919, states that any death under anesthesia due to exceptional circumstances is worthy of being recorded, and such a case as the following, if not unique, must at least be of very rare occurrence:

The patient was a young woman the subject of an incomplete abortion, and the anesthetic was administered in order to empty the uterus. The general condition was good and the heart sounds normal, according to separate examinations by himself and the operator. The anesthetic administered was A. C. E. mixture, the anesthesia presenting no abnormal feature until the operation was nearly completed and the actual administration had been discontinued. An active corneal reflex had been maintained throughout. At this stage the patient suddenly became intensely cyanosed and ceased to breathe. With artificial respiration and dilatation of the sphincter breathing recommenced and was continued for a minute or two, but had no effect upon the cyanosis, which continued intense, and on inversion a considerable amount of blood escaped from the mouth. Further methods of resuscitation were unavailing.

Post-mortem: Heart somewhat enlarged, mitral orifice narrowed; mitral valve, cusps thickened and contracted and partly united. Lungs: A little inhaled blood present at the backs of both lungs. There is some blood mixed with mucus in the air-passages from the larynx to the bronchioles. Spleen: Enlarged, congested; on microscopical examination congestion is marked, and there is increase in the number of cells normally found in the spleen, especially lymphocytes and phagocytic cells. There are also present cells resembling plasma cells and numerous nucleated red cells, suggesting a condition of anemia before death. Alimentary canal: Mouth, tongue, and pharynx smeared with blood. At junction of esophagus and stomach is a small round puncture in the mucous membrane with a dilated vein beneath the puncture—*i.e.*, ruptured esophageal varix. The stomach contains a little fluid mixed with blood; chronic gastritis is present. The other organs are normal. Cause of death: Asphyxia, due to the passage of blood from a ruptured esophageal vein (varix) into the air-passages and lungs whilst under the influence of an anesthetic.

There was no history of previous illness, nor of the occurrence of hematemesis, although the condition of the spleen implies preëxisting anemia, with the possibility of previous hemorrhage as its cause. The hemorrhage from the abortion had not been great. The escape of blood from the mouth, on inversion, suggested something uncommon as the cause of death, but diagnosis was, of course, impossible, and it is not easy to think of any available method of treatment which could have held out any prospect of success.

EFFECT OF TRAINING ON BLOOD-PRESSURE IN MAN.

DAWSON, in the *American Journal of Physiology* for December, 1919, states that the following summary of his tests is submitted. Credit to previous investigators together with comment and criticism is reserved for a separate communication.

I. The effect of training upon the resting pulse-rate, blood-pressures and their derivatives was as follows:

(*a*) The pulse-rate was slowed, especially the noon and afternoon pulses. This altered slightly the form of the diurnal pulse curve. The extent of the diurnal variation was increased.

(*b*) The diurnal variations of the systolic pressure were increased.

(*c*) The diastolic pressure approached the daily mean while its diurnal variations were much decreased.

(*d*) The pulse-pressure was usually increased and its diurnal variations were somewhat decreased.

(*e*) The forms of the daily curves of blood-pressures were not obviously altered.

(*f*) The product of the pulse-rate times the pulse-pressure was usually increased, but the character of its daily variations was unchanged.

II. The effect of training or of practice or of both upon the cardiovascular reactions to exercise was as follows:

(*g*) When the trained or practiced individual engaged in physical exercise he naturally accomplished more work with less apparent exertion and less subjective distress. This was in spite of the fact that the systolic pressure rose higher, the pulse-pressure increased enormously, and with it sometimes the product P. R. $\times$ P. P. (pulse-rate $\times$ pulse-pressure).

(*h*) The diastolic pressure sometimes returned earlier to normal—*i.e.*, while the exercise was still in progress.

(*i*) The pulse-rate, however, was sometimes less affected than in the untrained subject, and probably reached normal before that of the latter.

III. The following interesting miscellaneous observations were also made:

(*j*) An acute infection (nasopharyngitis) caused an increase in the pulse-rate but no change in the blood-pressures. In the trained subject the change in pulse rate was much less pronounced.

(*k*) During acute infection (nasopharyngitis) exercise caused a greater increase in pulse-rate than with the normal subject, and the amount of work accomplished was less.

(*l*) The feeling of distress which occurred during exercise showed no relation to the heart-rate and blood-pressure determined at the cessation of the exercise. When distress followed exercise it had no relation to the blood-pressure present at the time, but the heart-rate was found to be greatly decreased.

AORTIC ANEURISM TREATED BY WIRING AND ELECTROLYSIS.

HARE, in the *Journal of the American Medical Association* of December 20, 1919, states that on a number of occasions in the past he has reported in the pages of the *Journal* and in the THERAPEUTIC GAZETTE cases of aortic aneurism treated by the introduction of gold-platinum wire and electrolysis. The previously reported cases combined with the three herewith presented make a total of thirty.

He states that there are several points essential to the success of this method, and a number of others which, when understood clearly, show why it cannot always succeed:

1. The aneurism must be sacculated, not fusiform, and if it be of the dissecting sacculated type it is the most favorable for good results. It is not only useless but dangerous for obvious reasons to operate on a fusiform aneurism.

2. Although it is not at all necessary for the aneurism to have eroded the chest wall so as to protrude, it must be close enough to the chest wall anteriorly or posteriorly to permit the insulated needle to enter the sac.

3. The wire must be of gold and platinum so that it will coil properly in the sac.

A gold-copper wire is useless because the copper is eaten out so rapidly by electrolytic action that the procedure cannot be completed.

4. Great care must be taken that the skin over the sac is protected from electrolytic action by having the external part of the needle well insulated as well as the shank.

5. Depending on the size of the sac, the amount of wire varies, but it is usually from 15 to 20 feet.

6. The time during which the current is allowed to pass is usually about forty-five minutes, and the current strength must be turned on and off very gradually.

7. If the street current is used, great care must be taken that the proper reducing apparatus is employed, and also that the table on which the patient lies is insulated with rubber pads and that the operator and his assistant wear rubber-soled shoes.

The facts that stand in the way of complete success are that in a large proportion of cases the entire aortic wall is diseased, the area operated on being chiefly in trouble. Solidifying the contents of the sac is well so far as it goes, but other parts of the aortic wall give way later. In many cases the entire arterial system is diseased, and the only patient he has seen who did not get relief from pain before the operation was finished died suddenly some time later, and the necropsy revealed a second sacculated aneurism just above the diaphragm which had ruptured.

The prognosis, therefore, depends largely on the general state of the vessels. If this is good and the aneurism seems to have resulted chiefly from injury, the prognosis is better than if the general vascular state is bad. Syphilis is manifestly an active factor.

When the growth is very large, and particularly if its pressure has already begun to cause pulmonary edema or pleural effusion, the procedure is, of course, a forlorn hope.

The value of the procedure lies in the following facts:

1. The extraordinary decrease in pain, which, as already stated, usually takes place soon after the current begins to pass. Whether this easement of pain is due to decrease in the tension in the sac with its associated diminution of pressure on adjacent tissues, or whether it is due in whole or in part to a sedative effect of the current, he is unable to state; but he is inclined to the former view. This relief from pain, which has previously required large amounts of morphine, justifies the operation even if life is not greatly prolonged.

2. Arrest of the progress of the growth, at least in the direction in which it threatens to rupture. He has reported a number of cases in patients in whom blood was actually oozing through the discolored skin when treated, but who lived for months.

THE BASAL METABOLISM IN EXOPHTHALMIC GOITRE.

MEANS and AUB, in the *Archives of Internal Medicine* for December, 1919, state that in the first place it seems clear that the majority of patients ultimately do as well with Roentgen-ray therapy as with surgery, and that with less hardship to themselves. This being true, and in view of the not infrequent fatal outcome of surgical operations on the thyroid, the Roentgen-ray form of treatment would seem to be the method of choice. They do not mean by that that surgery is never indicated. Such cases as failed to improve under Roentgen-ray therapy and promptly recovered after operation prove that surgery may be necessary. It will, however, be interesting to note in this connection that of a total of twenty-four patients who were operated on, nine had had more or less Roentgen-ray treatment before surgery was done. Their group illustrating the effect of the Roentgen ray includes only those patients who received Roentgen-ray treatment and rest alone; the group showing the effect of surgery, on the other hand, includes patients who had had Roentgen-ray treatment before operation.

In this connection they also call attention to the fact that none of the five patients who died following operation had received

Roentgen-ray treatment beforehand. It is further interesting to note that in the ten postoperative cases in which they have two to three year end-result observations, the basal metabolism of five patients who had Roentgen-ray treatments before operation averaged 6 per cent plus, while that of five patients who were operated on without previous Roentgen-ray treatment averaged 20 per cent plus. The metabolism of the former group of five averaged 44 per cent plus before operation and that of the latter 50 per cent plus. While the two groups started about evenly, therefore, at the end of two years the group in which surgery was preceded by Roentgen-ray treatment showed a far better result than the group in which surgery alone was done.

In view of all this, it seems clear that not only should the Roentgen-ray be tried first in the management of exophthalmic goitre, with the idea that it may be sufficient to cure the patient, but also because if not alone sufficient to cure, it may render subsequent operation safer, and more likely to be followed by good end results. Surgery, they believe, should be employed with conservatism, and usually only after the Roentgen-ray and other medical measures have failed. They also believe that after operation, if the metabolism remains elevated, the Roentgen-ray should again be employed. A case in point is that of a woman with whom no great fall in metabolism was secured by operation, but who later definitely improved under Roentgen-ray treatment.

In this connection they believe that the Roentgen-ray treatment of the thymus is quite as important as that of the thyroid. In the cases that come to operation it seems possible that the safety imparted by previous Roentgen-ray treatment is due in some measure to the effect on the former gland.

Numerous writers have felt that the sudden deaths following operations on the thyroid were of thymus origin. Kocher, Halsted and others have performed thyrectomies with favorable results. Klose and others have shown that involution of the thymus follows irradiation. Treatment of the thymus by the Roentgen-ray, therefore, to their minds, should form a part of the preoperative treatment of exophthalmic goitre. Exposure of the thyroid, they believe, should also be carried out. That Roentgen-ray exposures of the thyroid render operations much more difficult through the production of adhesions between gland and capsule is denied by Porter.

Can we now go a step further, and find in these metabolism studies anything that enables us to predict what patients probably will come to operation, and in which ones operation is contraindicated? Means and Aub believe we can.

A study of the relation of pulse curve to the metabolism curve in individual cases shows two fairly definite types: Type 1, in which the pulse rate (when plotted in a uniform way with a base line of a pulse rate of fifty and a normal metabolism, and a top line of a pulse rate of 150 and metabolism 100 per cent plus) runs ten or more points above the metabolism curve; and Type 2, in which the pulse curve coincides with, or runs below, the metabolism curve.

Eppinger gives an extreme tachycardia as one of the characteristics of the sympatheticotonic type, while a moderate tachycardia occurs in the vagotonic, and the latter type is presumably the one in which there is most pronounced thymus involvement. Without entering into the discussion as to whether two such types actually exist, it occurred to Means and Aub that it would be well to compare the end results in those of their cases that had an extreme tachycardia and a moderate metabolism elevation on the one hand (Type 1) with those that had an extreme metabolism elevation and a moderate tachycardia (Type 2) on the other hand. A study of the end results in these cases shows that the patients of Type 1 did about equally well with surgery or Roentgen-ray alone, or with surgery preceded by Roentgen-ray treatment; while with Type 2, surgery alone gives poor results, the Roentgen ray alone may cure, but the Roentgen ray fol-

lowed by surgery may be necessary in the more resistant cases.

Of the five patients who died following operation, four belonged to Type 2 and only one belonged to Type 1. The chance of postoperative death, therefore, seems greater in Type 2, at least when Roentgen-ray treatment has not been given beforehand.

An apparent contraindication to operation was found in a metabolism rising in spite of the fact that the patient was getting complete rest in bed at the time.

The conclusions drawn in their first paper are borne out by subsequent work. In addition, they say that using the basal metabolism as an index of toxicity in exophthalmic goitre they have found that:

1. In the majority of cases the results after two or three years are equally good with Roentgen-ray treatment as with surgery.

2. That after surgery the metabolism shows a rapid preliminary fall, and a secondary rise followed by a final fall; that with Roentgen-ray treatment there is a gradual progressive fall.

3. That in securing the same end results with surgery or with the Roentgen ray, a lesser rest factor is necessary with the Roentgen ray. With the Roentgen ray there is practically no mortality. With surgery there is a definite one.

4. The patients treated surgically do better, and the risk of operation is less, if they have previously had their thyroid and thymus glands irradiated.

5. That the risk of operation is greater and the need for preoperative Roentgen-ray treatment is greater in cases with a very high metabolism and moderate tachycardia than in those with an extreme tachycardia and moderate metabolism elevation.

6. That the safest programme for the treatment of exophthalmic goitre, as a whole, is the routine irradiation of thyroid and thymus glands, in all cases, with surgery held in reserve for patients who do not then do well.

7. That surgery is contraindicated with patients whose metabolism is rising in spite of complete rest in bed, and also with patients of the type with moderate tachycardia and great metabolism increase, except when they have previously had thyroid and thymus glands treated by the Roentgen ray.

8. Finally, they believe that in the management of exophthalmic goitre, periodic determination of the basal metabolism should be quite as much a routine as is the examination of the urine for sugar in diabetes mellitus. Further, that in borderline cases the basal metabolism furnishes very valuable aid in differential diagnosis.

THE PREVENTION OF ANAPHYLACTIC SHOCK.

In an important communication to the Académie des Sciences, RICHET, BRODIN, and SAINT-GIRONS (*C. R. de l'Académie des Sciences,* July 7, 1919) make the following statement:

"If three weeks after a preliminary (sensitizing) injection of a horse plasma into a dog we give the same dog another (assaulting) injection of 50 Cc. of the same horse plasma, the anaphylactic reaction, which never fails, is abrupt, sudden, and intense. Diarrhea, almost hemorrhagic, intestinal congestion, rectal tenesmus, vomiting, dilatation of the pupils, lowering of the arterial pressure, absolute motor paralysis, asphyxiated respiration, feeble cardiac contractions, and a weak pulse are the phenomena that result. Usually death occurs in two or three hours, sometimes even in a few minutes. If instead of injecting the plasma alone we inject the same quantity of plasma diluted with nine times its volume of isotonic salt solution, practically nothing happens. At the most there is slight diarrhea and rectal tenesmus with faint paretic disturbances in the muscular function, but quite rapidly, in a quarter to half an hour, these pass off, and the animal recovers without any difficulty. It is not the mere dilution of the plasma that prevents the explosion of the assaulting in-

jection, for if we substitute for the isotonic salt an isotonic solution of glucose, or a 0.4-per-cent solution of sodium chloride, or distilled water, anaphylactic phenomena are produced almost as intense as if plasma alone had been used, and death occurs in the majority of these cases. Similarly, if we dilute the plasma with five instead of nine volumes of isotonic salt solution, the same explosive phenomena are called forth. Again, if the salt solution be injected first and the plasma afterwards, the anaphylactic shock is not avoided, whether the salt be injected forty-eight hours previously or even immediately beforehand. The reason probably is that the sodium chloride is so very rapidly eliminated in the urine; even in half a minute there is an increase in the salt content of the urine. If, however, large quantities of salt are injected the body is saturated with it, and the excess persists for some time. The injection of 75 Cc. of a 20-per-cent solution of salt half an hour before the injection of the plasma into a dog prevented the occurrence of anaphylaxis. It would thus seem that the sodium chloride had a protective action against the assaulting injection. It was found that 3.6 grammes of salt when mixed with the plasma had this protective effect, much smaller quantities being inefficacious. If the injection of salt is given before the injection of plasma very much larger quantities, impossible to calculate, would be required, since the elimination of the salt takes place with extreme rapidity. It would appear, then, as if the sodium chloride impregnated the nerve cells and rendered them immune to the anaphylactic poison."

The authors connect this phenomenon with facts that Richet demonstrated several years ago on hyperchloridization. He showed that deprivation of sodium chloride rendered the organism much more sensitive to the toxic or therapeutic action of potassium bromide, whilst Lesne and Ch. Richet, jun., showed that the addition of a strong dose of sodium chloride rendered the body much less sensitive to the action of poisons. If the nerve cells are protected by strong doses of salt against the anaphylactic reaction it is probably because they are saturated with the salt and have thus become less capable of fixing other poisons on their protoplasm. Richet and his collaborators think that it is permissible to hope that a new method of immunization has been discovered which is almost comparable with anti-anaphylaxis, although not identical with what follows the injection of very minute doses of the assaulting substance. It is probable that this immunizing action of large doses of sodium chloride is general, and that it is not peculiar either to the dog or to horse plasma. When there is a lack of salt the cells more readily fix the poisons, and when there is an excess the fixation is rendered difficult.

IN THE TREATMENT OF LEG STUMPS.

YOUNT (*New York Journal of Medicine*, November, 1919) observes that in the treatment of amputation the advisability and necessity for provisional appliances is evidenced in the catalogues of artificial limb-makers, where numerous types of "shrinkers" and preparatory legs are advertised. We are informed that these commercial preparatory legs are comparatively little used for various reasons: To fit an appliance to a boggy, tender stump, and to provide for the adjustment of the appliance so that it would continue to fit a rapidly changing stump; to do this without personal contact with the patient and to construct such an appliance at a reasonably low cost is a problem the satisfactory solution of which could hardly be expected. A shrinker is a cuff made of leather or other material, which is constructed so that it will approximately fit the stump, and is provided with a lacer so that compression of the stump can be effected. The fallacy of this method of preparing the stump for weight bearing and locomotion is apparent.

As American permanent artificial legs are admittedly efficient and perhaps the best that can be obtained, little effort has

been expended on this feature of the problem. Considerable, however, has been done in attempting to improve provisional appliances.

In order to appreciate the necessity for a provisional appliance, it will first be necessary to analyze the new function of the stump leg and to study the physiological changes which take place in the stump in the performance of its new and abnormal function.

Briefly, the functions of the stump leg are locomotion and weight bearing. Locomotion is little different in the stump leg than in the normal leg, except that greater skill in balancing must be acquired. One is apt to think only of the weight bearing part of the stump leg in this consideration and to overlook the important part played by the proximal part of the leg, especially in locomotion. The term "stump leg" is used advisedly.

The error of applying a shrinker to the stump and then allowing the patient to go about for weeks on crutches with the stump leg hanging inactive is evident; the result being, of course, atrophy from disuse, involving not only the stump but the entire stump leg instead of functional pressure atrophy of the stump only. We should aim then to preserve the full power of muscle groups proximal to the weight-bearing part of the stump and to avoid by all means joint contractures, and if they have occurred, to take early steps to correct them. The provisional appliance is a potent therapeutic measure in the correction of contractures, when it is properly applied.

In using an artificial leg, the distal part of the stump leg is called upon to perform an entirely new and abnormal function, *i.e.*, weight bearing. This weight bearing in the case of below-knee amputation is distributed as follows: (1) Cone bearing (lateral or surface bearing). (2) Bony prominence bearing (head of tibia, tuberosity of tibia, fibula below head). (3) Partial thigh surface bearing (thigh cuff). (4) In certain percentage of cases, end bearing. In a finished appliance the stump is encased in a solid shell, which is molded or carved to fit the stump, so that all the bearing points and surfaces are used to a variable degree. The physiological changes in the stump will depend largely upon the predominating type or types of bearing chosen in a particular case. Cone and bony prominence bearing with slight partial thigh bearing are found to be applicable to most below-knee cases. Pressure atrophy is rapid and marked, consequently repeated remolding of the socket is imperative. Atrophy of the thigh in the region of a lateral bearing (thigh cuff) is slow, but certain, and distinctly objectionable. End bearing diminishes pressure atrophy both in the stump and thigh. This is one of its main advantages, as locomotive powers are more fully preserved. In amputation of the thigh, bony prominence bearing (ischial tuberosity), cone bearing, and, in certain cases, end bearing, are utilized. Bony prominence bearing predominates, so that pressure atrophy of the stump is slower and less marked than in below-knee stumps. End bearing in thigh stumps has the same relative advantages as those mentioned in below-knee stumps, but to a less degree, inasmuch as the gluteal muscles and adjacent groups attached to the pelvis and body are interfered with very little in any case.

RECENT ADVANCES IN GASTRIC PHYSIOLOGY.

ALVAREZ (*American Journal of the Medical Sciences,* November, 1919) points out that if we watch the human stomach with the fluoroscope the contractions seem to begin on the greater curvature near its middle or a little below. As they approach the antrum they deepen and suddenly their whole character changes. The indention becomes equally deep on the two curvatures, so that the wave may cut the stomach shadow almost in two. These local differences in the peristaltic wave correspond perfectly to the regional peculiarities of tone and amplitude in the muscle through

which it must pass. It is probable that the waves which seem to begin in the lower third of the stomach have come as ripples from the highly rhythmic region on the lesser curvature near the cardia.

Although the direction of peristalsis may be maintained by or be due mainly to the gradient in rhythmicity, other important and closely related gradients can be demonstrated. In the first place the region around the cardia is the most irritable part of the stomach. It also has the shortest latent period. The importance of this gradation is shown best in the simple stomach of the frog. There an electric stimulus to the pyloric antrum will show itself as a contraction in thirteen or fourteen seconds. Before that time elapses, however, the stimulus spreads to the cardia, where, after eight seconds, it shows itself as a peristaltic wave. This wave gets well down toward the pylorus before any change is visible at the point stimulated. We see then that this mechanism alone could insure the aboral direction of peristalsis.

So far very little work has been done on the anatomical side of the problem. Keith has found nodal tissues in the highly rhythmic area on the lesser curvature near the cardia. Openchowski found peculiar ganglion cells around the cardia different from those in Auerbach's plexus.

It is not generally known that there is a fairly complete connective-tissue barrier between the muscle of the antrum and the duodenum. Ordinarily there are only a few bundles from the longitudinal coat which pass over. This explains the fact that the gastric waves do not run over on to the duodenum. Graphic records show that some influence may pass over to start peristaltic rushes in the bowel, but the deep waves, visible to the unaided eye, stop at the barrier.

After years of experiment it has been established that the stomach can perform its functions quite satisfactorily after section of all extrinsic nerves. Now we see that these functions are probably dependent upon graded differences in rhythmicity, irritability, latent period and metabolism in the local neuromusculatory apparatus. If this is true, then any changes in these gradients must influence the peristalsis and the emptying time of the stomach. Such changes have been found in sick animals. In distempered dogs and snuffling cats the gradients of latent period and metabolism were often reversed and practically always made irregular and less steep. This was due probably to the fact that the muscle at the cardia is so much more sensitive to adverse conditions and probably to disease toxins than is the pyloric muscle. Similar upsets were observed in the intestinal gradients in these sick animals.

A number of surgeons have commented on the fact that a V-shaped incision of an ulcer on the lesser curvature is likely to interfere with the emptying of the stomach, while a sleeve resection usually gives a much better result. We can probably explain that now in the following way: Ordinarily the wave originating at the cardia has to travel faster along the greater curvature than along the lesser curvature because the greater is longer. Apparently both sides of the wave must reach the pylorus at the same time in order to secure good emptying. Now, time and again while watching the human stomach under the screen the author has seen the two sides of the wave reach the antrum unevenly, so that they met not at the pylorus but at a point on one side or the other. Sometimes the arrival of part of the wave at the pylorus seemed to block the other part of it still advancing along the greater curvature.

While watching gastric peristalsis in the rabbit and also in man it has often seemed to him that there must be a wave of excitation traveling ahead of the visible contraction. Owing to its greater irritability and shorter latent period the pyloric ring responds to the excitation a little ahead of time. The resulting contraction blocks the advancing peristaltic wave and keeps it from putting any pressure on the sphincter. This may explain why some stom-

achs do not empty well in spite of good peristalsis and a patent pylorus.

While peeling off the strips of muscle it was found that the submucosa was quite deficient along the lesser curvature from the cardia to the antrum. The mucosa is fastened to the muscle there much as the skin is to the palmar fascia of the hand. In the rest of the stomach, and particularly the antrum, the strips could be peeled off easily. These differences may have some influence on the spread of carcinoma and on the penetration of ulcer.

It is an interesting observation that in animals the region corresponding to the duodenal cap has a poor rhythmicity. Excised segments put into warm oxygenated Locke's solution often do not contract at all, and when they do they generally show an irregular rhythm with small amplitude. This may be due partly to the peculiar festoon-like arrangement of the muscle fibers in this region. As would be expected, this comparatively inactive segment, situated as it is between two strong and active ones, tends to remain filled with food for long periods of time.

It is a well-known fact that carcinoma very rarely originates in the duodenum, and when it begins in the stomach it will not spread across the pyloric line. It seems probable now that this is due to a difference in metabolic rate on the two sides of that line. Estimations of the catalase content of the mucous membrane from different parts of the digestive tract showed that the lowest figures are to be obtained in the pyloric antrum and the highest in the duodenum.

The author summarizes his studies as follows:

The gastrointestinal tube may originally have been constructed so that the rhythmicity of any one segment varied inversely as the distance from the pharynx.

The stomach has been evolved from this simple tube much as the heart has been enlarged and specialized. The remnants of the primitive tube are to be looked for along the lesser curvature.

A highly rhythmic area has been found on the lesser curvature near the cardia.

Strips of muscle excised from different parts of the gastric wall can be made to beat rhythmically in warm, aerated Locke's solution. Speaking roughly, the rate of contraction varies inversely as the distance from the cardia.

Differences in the depth of the waves as they sweep over the stomach can be explained by differences in tone and amplitude of contraction of the muscle in different parts of the organ.

There is a gradient of irritability from cardia to pylorus. The latent period is shortest near the cardia and longest in the pyloric antrum.

The muscle in the pars pylorica appears to be quite different from that in the rest of the stomach. It is especially fitted to do the hard work of that organ.

The pyloric ring is more irritable and has a shorter latent period than that of the pyloric antrum. This may have considerable bearing on the problems of poor gastric emptying in ulcer.

The duodenum is much more irritable than the antrum and its rhythmic rate is much higher.

The muscle on the lesser curvature near the cardia is very sensitive to trauma and to adverse conditions which seem to have no effect on the muscle from the antrum. This difference may account for the fact that the normal downward gradients of rhythmicity and latent period were altered and even reversed in sick animals.

Evidence is presented which suggested strongly that there is a gradient of metabolism underlying and perhaps giving rise to the gradients of irritability, latent period and rhythmicity which, it is believed, determine the direction of peristalsis. The metabolic gradient is often found reversed in sick animals which are refusing food.

There appears also to be gradients of metabolism in the mucous membrane of the stomach. The lowest values in the whole digestive tract are found in the antrum. It is shown how this may explain

the high incidence of cancer in that region and the inability of the tumors to cross over into the duodenum, where there is a very high metabolic rate.

An explanation is given for the fact that a sleeve resection gives a better functional result in ulcer of the lesser curvature than a V excision.

THE CONTROL OF THE PYLORUS.

LUCKHARDT, PHILLIPS, and CARLSON (*American Journal of Physiology*, Oct. 1, 1919) note that from the earliest times anatomists and physiologists were deeply impressed with the "peculiar office and functions of the pylorus." Van Helmont conceived it to be the peculiar seat of the soul, and Richerand ascribed to it something like intelligence when he said that it has a peculiar tact which enables it to select from the contents of the stomach what is proper to pass through, while it rejects the remainder.

The more rational explanations which followed were essentially mechanical in nature but not entirely satisfactory. More satisfactory was the theory proposed by Cannon that the pylorus was under the chemical control of the acid chyme. The wealth of conclusive experimental evidence in support of this theory led early to its acceptance by clinicians and physiologists, so that at the present day its general correctness is not doubted. But Cannon himself stated that other factors might modify the chemical control, especially under abnormal conditions. To this many observers will readily agree, and will quickly point out that Cannon's theory not only fails to explain the emptying of the stomach in achylia gastrica, but that Cannon never convincingly explained the rapid exit of water and neutral egg-white solution which left the stomach before the free acidity of the intragastric contents was present to effect an opening of the pylorus, or sufficiently concentrated after ejection into the duodenum to effect its closure.

There is a correlation between marked motor activity of the stomach (either as tonus changes or peristalses) and an inhibition in tone of the pyloric sphincter. The work of other investigators is not at variance with these results. On the contrary, most investigators recognize that factors other than the presence of free acid in the stomach near the pyloric sphincter are related to an opening of that sphincter.

Fluoroscopic examination of the stomach of man while recording graphically the motor activity of the stomach shows that the pylorus opens for the ejection of chyme with arrival at the pylorus of powerful advancing rings of constriction, aided possibly by a general increase in tone of the stomach musculature as a whole.

In dogs the intragastric contents issue from a duodenostomy either (*a*) during a marked rise in the intragastric pressure probably unaccompanied by peristaltic activity, or (*b*) more commonly just at or after the peristaltic wave or waves passing over the stomach have effected their greatest increase in intragastric pressure.

There is certainly a greater relation between the muscular activity and the opening of the pylorus than between the latter and the reaction of the intragastric contents.

Vomiting is more easily induced by irritating duodenal mucosa than by an irritation of the gastric mucosa.

STUDIES ON THE RELATION OF DUST TO THE SPREAD OF TUBERCULOSIS.

SWEANY and MACLANE (*Illinois Medical Journal*, December, 1919) have conducted a laboratory study which, though bringing forth nothing new, is serviceable as accentuating well-known facts often forgotten. They allude to Cornet's experiments. He injected guinea-pigs with the sweepings of jails, asylums, dwellings, etc., where consumptives were housed. The result of these experiments was that tuberculosis was not found unless a consumptive had occupied the quarters, and where open cases of tuberculosis dwelt a very high per-

centage of positive results were obtained. Out of a total of 147 samples of dust 46 were found to be positive.

Naturally, Cornet considered the problem solved—that is, that tuberculosis was spread by inhalation of dust containing tubercle bacilli. This idea pervaded the field for several years, until Flügge published his work. Flügge observed that the most experimental inhalation infections had been produced by moist sprays of tubercle bacilli rather than by dust or dried sputum. From this he concluded that infection will result rather from inhalation of moist droplets coughed out by consumptives than from dust. Accordingly, he performed a series of experiments over a period of several years, showing that bacilli may be coughed out by patients; that these droplets will float from sixteen to thirty-two inches, and that they will stay afloat for twenty minutes.

Of the recent workers Suparker has performed noteworthy experiments. His work consisted in experiments on the resistance of tubercle bacilli under varying conditions, such as sunlight, diffuse daylight, darkness, etc.

According to his results, tubercle bacilli will live twenty days in moist sputum; three hundred and nine days in the dark, five days in diffuse daylight in dust, and two hours in direct sunlight in dust. His work clearly shows that sunlight is the worst enemy of tuberculosis.

Sweany and MacLane worked with dust at the City of Chicago Municipal Tuberculosis Sanitarium and the Cook county jail. Dust from several dwellings was also worked up. Sweepings of dust were collected from the various rooms with new sterile brooms, placed in sterile paper bags, and taken to the laboratory, where the material was worked up as soon as possible.

The results obtained demonstrate two points very clearly: first, that in the rooms of tuberculosis patients there are given off living virulent tubercle bacilli, and second, that living virulent tubercle bacilli live for several days in the ordinary room used to care for tuberculosis patients. This work has not proved how many cases arise from dust laden with tubercle bacilli. That would indeed be a hard task to perform. In the first place, doses that are capable of infecting guinea-pigs may be too small to infect many human beings, especially adults, because most people apparently have a certain degree of immunity for tuberculosis. Then, again, the infected dust may not reach the lungs, but may lodge in the upper respiratory passages, where the organisms are unable to set up infection. Furthermore, if the organisms do reach the lungs, the natural means of cleansing, such as cilia and mucus, may throw the organism out before infection results. At best it would be hard to estimate the percentage of cases that can arise from tuberculous dust.

It is sufficient after all, however, to know that there are living tubercle bacilli in the dust and on the walls of rooms occupied by open cases of tuberculosis. The bare fact that tubercle bacilli are present is indicative of grave danger. The virulence of the organisms found need not be questioned, because Corper has demonstrated that 97 per cent of tubercle bacilli from sputum are virulent.

Infected dust would be especially dangerous to infants who crawl on the floor near the dust and who are at the most susceptible age for infection. In fact, Webb has shown in one case that the infant is very similar to the guinea-pig in susceptibility. Of course, this does not indicate that all infants are necessarily around open cases of tuberculosis. However, there must be some means of contracting the infection in early childhood, because most children show signs of infection before the age of five years. There is no doubt that many become infected through contaminated food and by direct contact.

The question of infection through other channels than the lungs may be of greater importance than is commonly thought. There may be some yet undiscovered way whereby the organisms may get into the system, because, as Krause has reasoned, the lesions appear many times in the spleen

and liver, as soon as and with greater involvement than in the lungs. To get to the spleen it is evident, therefore, that the organisms travel either by the blood or lymph channels. It may be possible that the organisms travel from the tonsils, intestines, or any other part of the body where the organisms may come in contact with the blood or lymph streams. The leucocytes, for instance, may engulf the organisms at the point of entrance and carry them to the organs of the body where conditions are most favorable for their growth. As apparent proof of this reasoning we may cite the fact all bone infections must result from some such means.

The experimental evidence in this paper indicates, also, that the organisms do not survive in south rooms as long as they do in north rooms. In the first place, the dust control tests survive seven days in north rooms, whereas they survive only five days in south rooms; and second, there were seven positive samples of dust in double and single rooms on the north side, whereas there were only two positive in the same class of rooms on the south side.

Another noteworthy fact is that there were a greater number of positive samples taken from the porches than from any other class of rooms. Since the porches are all facing south, there is only one conclusion that can be drawn, namely, that the greater number of open cases there are, the greater is the chance of finding the organisms. This is only what we should expect.

Of 134 samples of dust taken from rooms where open cases of tuberculosis were being treated, 12 were found to be positive.

Of 18 samples taken from the Cook county jail three were positive.

Seven positive cases were found in single and double rooms facing north, while only two were found in rooms facing south.

The greatest percentage of positive samples were found in places where the greatest number of open cases were being treated.

A suspension of tubercle bacilli in salt solution was killed in twenty minutes in direct sunlight with the sun's rays at an angle of 50 degrees; five hours in a film of dust in a south room, and seven days in a film of dust in a north room.

MODIFIED OPERATION FOR SCROTAL VARICOCELE.

MEAKER (*Lancet*, Nov. 29, 1919) thus describes his operation:

An incision about 1½ inches long is made over the cord just below the external inguinal ring, and is deepened until the external spermatic (intercolumnar) fascia is seen. This is picked up with two pairs of dissecting forceps and nicked between them. It readily lifts up from the underlying cremaster, but there is no advantage in separating the two layers further. The cremaster is next picked up and nicked in a similar manner. The cut edge of the external spermatic fascia and that of the cremaster are now clipped together with a Spencer Wells forceps on each side of the nick, and the incision in these structures is extended longitudinally up and down for an inch or more each way. A little traction by an assistant on the Spencer Wells forceps will enable one easily to slit the cremaster for three inches through a skin incision of half that length. The assistant should now spread the slit open by using the forceps as retractors, while the surgeon, with his finger or a blunt dissector, gently separates the cremasteric tube all around and for a length of at least two inches from the elements of the cord in their investment of internal spermatic (infundibuliform) fascia. This separation is very easily effected except at the back, where a little force, as a touch of the scalpel, may be necessary. If it is thought desirable to resect veins, it may be done at this stage. Meaker rarely does more than to remove the three or four worst, tying each vein separately with the finest catgut, and making no attempt to bring the ligated ends together.

The next step is the shortening of the cremaster. This is accomplished by eight interrupted sutures of fine catgut, introduced longitudinally into the muscle, so

that when they are tied the cremaster is puckered. Each suture picks up the muscle at three or more points; the distance between the highest and the lowest of these represents the amount of shortening that is obtained after tying. One should aim to bring the top of the testicle to the level of the root of the penis. The four sutures in the posterior half of the cremasteric tube are introduced from within, the cord being retracted first to one side and then to the other. They should pick up only the muscle, and should lie exactly in the direction of the long axis of the tube. Unless these precautions are observed, there is some danger of including the genital branch of the genitocrural nerve. If the cremasteric innervation is destroyed, the whole purpose of the operation is defeated. Before these posterior stitches are tied, the edges of the incision in the tube are approximated by the Spencer Wells forceps, and the four anterior sutures are introduced from without, including intercolumnar fascia as well as cremaster. The incision is now spread open again and the posterior sutures are tied. Next, one removes the forceps and ties the anterior stitches. An additional external stitch may be inserted directly over the cremasteric incision. A little care in infolding the puckered area will enable one to avoid a "bunchy" appearance and to leave a smooth surface. Suture of the skin in the ordinary way completes the operation.

The advantages claimed for this operation are the following: It can be as easily and quickly done as the common operation for varicocele; it is based on a sound anatomical principle; it gives adequate and permanent suspension to the testicle, which is essential to a radical cure of the condition.

The author states that he has had the opportunity of examining some of his patients after several months of active military service subsequent to the operation. In no case had any degree of the old ptosis returned, and all were free from symptoms. There is little or none of that plastic inflammatory thickening at the point of operation which so commonly occurs in cases done by the old method. The mobility of the testicle is not restricted by the formation of adhesions at this point. The operation is not followed by congestion of the testicle or any other form of circulatory disturbance. Convalescence is rapid; the patient gets up in a week, and permanently discards his suspensory in a fortnight.

The radical cure of varicocele can be done very satisfactorily under novocaine anesthesia. It is the author's custom to precede all local anesthetic operations with two doses of morphine and scopolamine. The object of this hypodermic medication is in no sense to combat pain or to gloss over an insufficient local technique, but simply to produce in the patient a calm and easy mental attitude rather than that state of worry and tension which may make even a painless operation an acutely unpleasant experience. The size of the doses must be regulated for the individual case, according to (1) the age and weight of the patient; (2) the magnitude of the proposed operation; and (3) the patient's temperament. The second dose can often be most nicely estimated after carefully observing the effect of the first. For an average varicocele case the following would be suitable dosage:

Morphine, gr. 1/4 Scopolamine, gr. 1/150	Two hours before operation.
Morphine, gr. 1/6 Scopolamine, gr. 1/200	One hour before operation.

It is desirable to have screens around the bed from the time of the first injection, and to forbid all talking and unnecessary noise in the theater while the operation is in progress. Questions such as "Does it hurt?" and "Do you feel that?" do no good, and are likely to act unfavorably by suggestion. Scopolamine produces a dry mouth, and patients are sometimes distinctly uncomfortable from this cause; in such cases water may be given.

The novocaine technique consists of two

injections, of which the first is done as follows: The cord should be picked up through the skin with the left thumb and forefinger at its point of exit from the external ring. A drop of novocaine is injected into the skin over the cord as high up as possible. Before this is done the patient shoult be warned that he is about to feel a sharp "pin-prick." Next, a fine needle, about 1½ inches long, should be passed, detached from its syringe, through the anesthetized point into the center of the cord. There is no danger of wounding the vas, as it readily rolls away from the point of the needle. If a vein should be punctured (this does not often happen) the appearance of blood at once makes it evident. Four cubic centimeters of a 2-per-cent solution of novocaine are now gently injected into the cord. A larger amount is not necessary, and may produce sufficient edema to interfere with the neatness of the operation. In about five minutes a conductive anesthesia of the scrotal contents on the injected side will have developed. In the meantime one makes the second injection—an ordinary infiltration of the skin along the line of incision with the same solution, starting at the point through which the first injection was made. This method of anesthesia is suitable also for orchidectomy, epididymotomy, the radical cure of hydrocele, and other intrascrotal operations.

HERNIA—SHOULD IT BE CLASSED AS A COMPENSABLE INJURY OR DISEASE?

Colcord (*International Journal of Surgery,* November, 1919) concludes as the result of a study of this question that two men in every 100 have a hernia. These men are not as efficient as the other 98. Their average length of life is somewhat shorter. When a hernia first appears there is usually a period of disability of varying time.

The ease, safety and comparative cheapness of the modern operation for the radical cure have made it popular, and most men wish to avail themselves of it at the first favorable opportunity. Most industrial workers are quite willing to be operated on at the expense of their employers.

The old idea that a hernia is a "rupture" in the belly wall, caused almost always by violence at some one moment in the life of the ruptured one, believed and taught by the ancients, by the monks and scholars of the middle ages, and by surgeons of the seventeenth and eighteenth centuries, has obtained such a firm hold upon the minds of the laity that it still prevails.

The English judges for centuries have clung tenaciously to the rupture fallacy.

A employs B. B lifts a little too hard some day, or thinks he does, and bing! he is ruptured. Then he demands that A get his hernia operated and not only pay B for his lost time, but also pay the hospital bill and surgeon's fee. If A refuses, B simply sues him, and the rest is easy. Any judge has only to open some musty old volume of English law and hernia decisions confront him on every page, and they are all one way—from the famous decisions in the House of Lords, the highest judicial tribunal in England, that "hernia is an accident," down to that of a judge in the remotest hamlet. Hernia is a rupture, the result of an accident, and the employer is liable. A must pay the bill.

And our American legal procedure is modeled directly upon the English. Their legal decisions influence and often determine ours. So American courts, judges, lawyers and compensation boards have swallowed the rupture idea whole. In Pennsylvania alone during the past three years over 4000 hernia claims have been paid under our present compensation law.

It matters not to these legal lights what men think who have made a lifetime study of hernia on the human subject. The opinion of men like Sir Astley Cooper, Bassini, McEwen, Halsted, Murphy, Bull, Coley, Hopkins, Mayo, Lane, Berger, Crile, Da Costa, Keene, White, Bigelow, Bevan, Ag-

new, Gorgas, and Lauffer—men who, in the aggregate, have done hundreds of thousands of hernia operations, who have made thousands of dissections, who have studied the development of the funicular canal from its first appearance in the embryo, through its various changes, till they see it fully developed into the hernial sac—count for nothing when weighed against that of some old English judge whose earthly body now lies moldering in the grave these many years, who, when he sat on the woolsack in his powdered wig and looked wise, would not have known a hernia from a hole in the ground.

Let every surgeon in all this broad land take a firm stand that hernia is the result of a malformation or a disease, not an accident, that it is no more compensable than bowlegs, harelip, cleft-palate, a bald head, or absent-mindedness.

We will never convince the judges and compensation boards of the truth. Just say "hernia" to lawyer and watch him. He begins to brace himself, set his jaw, and you know by the determined look on his face and the far-away look in his eyes that he is getting ready to tell you what the English House of Lords decided about hernia nearly a century ago.

We must educate the masses. People everywhere must wake up to the fact that every man who buys a pocket-knife, a pair of shoes, or a ton of coal helps pay the unjust hernia tax. We must make men see the injustice of singling out the unfortunate hernia subject, and making him the object of charity, while the thousands of other unfortunates are left to shift for themselves.

We must put a stop to this wholesale malingering, this putting a premium on dishonesty, this temptation constantly placed before the ruptured workman to lie about his hernia and sell it to his employer.

When the people are thoroughly convinced, then pressure will be brought to bear on our legislatures and laws will be passed limiting the payment of hernia compensation to the traumatic and more severe sudden cases.

The traditional opinions of judges, lawyers, courts and compensation boards have for years been founded on the erroneous idea that hernia is a rupture of the belly wall usually caused by an accident or an unusual strain while working, and is, therefore, compensable the same as any other accident, and whereas it is now the belief of surgeons the world over:

That these opinions are wrong and opposed to surgical experience and well-ascertained facts.

That the great majority of hernias develop gradually in individuals having congenital or acquired defects of the abdominal walls.

That all hernias of long standing have well-formed hernial sacs with necks at the openings in the belly wall and have the escaped abdominal viscera contained within these preformed hernial sacs.

That the discovery and demonstration of well-formed hernial sacs at operations for the radical cure of hernias constitute *prima facie* evidence that such hernias are of long standing.

That the rare cases of hernia caused by direct trauma, inflicting tears or punctures anywhere in the abdominal walls, and hence properly called "traumatic hernia," exhibit at operation hemorrhages, ecchymoses, and fresh tears in the belly wall, and the escaped abdominal viscera contained within no hernial sac.

Therefore, where an employee claims compensation for a recently acquired hernia, caused by an alleged accident during his work, it is advised that the testimony of the operating surgeon or surgeons be heard, and that if such testimony show evidence of a well-formed hernial sac and other proofs of long-standing hernia, it is convincing and conclusive evidence that the acquired hernia was not caused by an accident during the course of the employee's work; that it was the outcome of latent anatomical defects during years of gradual development; that it arose through

no possible fault of the employer; that such hernia constitutes a disease, and that it is not properly compensable on the basis of alleged accidental injury.

The passage of the following amendment to the Compensation Law of Pennsylvania on the subject of hernia would seem desirable:

"Hernia is a disease which ordinarily develops gradually, being very rarely the result of an accident. Where there is real traumatic hernia resulting from the application of force directly to the abdominal wall, either puncturing or tearing the wall, compensation will be allowed. All other cases will be considered as either congenital or of slow development and not compensable, being a disease rather than an accidental injury, unless conclusive proof is offered that the hernia was immediately caused by such sudden effort or severe strain that, first, the descent of the hernia immediately followed the cause; second, that there was severe pain in the hernial region; third, that there was such prostration that the employee was compelled to cease work immediately; fourth, that the above symptoms were of such severity that the same were noticed by the claimant and communicated after the occurrence of the hernia. In case of the hernia, as above defined, compensation will be paid until such time as the employee is able to resume some kind of work with the aid of a truss or other mechanical appliance. If the employee refuses to permit an operation, the employer shall meet the requirements above specified, pay compensation not to exceed twenty weeks, following which his obligation shall cease and terminate, unless death results from the hernia, in which case the provisions of paragraph twelve shall apply. However, if the employee shall elect to undergo an operation, by a physician selected by the employer, the employer shall meet all expense incident to such operation and recovery, not in excess of one hundred fifty dollars, together with the compensation as provided during the periods of disability prior and following the operation except as hereinafter provided subject to the provisions of paragraph thirteen. If the employee refuses the services of the physician selected by the employer, preferring one of his own selection, the employer shall be relieved of all obligations concerning medical expense due to the operation and recovery, but shall pay compensation during the prior and resulting periods of disability, except as hereinafter provided. If death results from the hernia or operation, compensation shall be paid to the dependents in accordance with the terms of this Act.

"Where it is proven to the satisfaction of the compensation board or court that a well-formed hernial sac or other proofs of a long-standing hernia were found at the time of the operation for radical cure, a claim for compensation shall be disallowed."

CHRONIC TRIGONITIS IN THE FEMALE.

LINDEMAN (*Surgery, Gynecology and Obstetrics*, January, 1920) throws no light upon the etiology of trigonitis. As to its symptomatology he observes that the onset is generally insidious with gradually increasing frequency of urination, especially by day, but somewhat also at night. With this there is usually no pain, but at the end of the act of urination there is generally a sensation of incompleteness and a desire to pass more. The patient will empty her bladder, and within two or three minutes have an uncontrollable desire to urinate again, which usually, if yielded to, accomplishes nothing, or at most only a few drops are expelled. There is an almost constant desire to urinate, and many patients complain that by day they are obliged to relieve themselves as often as every five minutes, voiding only a few drops each time. As this condition progresses the patient becomes more and more miserable, all work, meals and even sleep are interfered with, and the patient is obliged

to devote her entire time to emptying or trying to empty her bladder. In these later stages there may be some pain, but it is rarely very severe; occasionally there may be a slight terminal hematuria. The chief complaint of these patients is the constant desire to urinate and the sensation of never completely having relieved themselves.

The bladder capacity is usually not diminished. The trigonal mucosa is swollen, dark-red, and intensely angry and cloudy.

Treatment is usually unsatisfactory. Therefore Lindeman practiced injections of quinine and urea hydrochloride solution by means of a long flexible needle introduced through a Brown-Buerger double-catheterizing cystoscope. The injected fluid is colored with methylene-blue, so that the observer may be assured that the point of the needle is within the tissues. The author begins his injections close to one ureter, works across the trigone to the other, and then works back again, at a level nearer the urethral orifice, each injection wheal abutting on its predecessor. The injections are continued to and into the sphincter and even the posterior urethra. Usually four or five are sufficient for the width of the trigone, and only about four or five rows from behind forward are necessary. It is remarkable how little discomfort the treatment occasions, but even more remarkable how great, although temporary, a relief can be brought about by the injection of only two or three minims just in front of each ureter, leaving the balance of the trigone entirely untouched. This is probably a direct result of the anesthetic effect of the quinine. The author states that there must be a slight danger of necrosis and ulceration of the mucosa, since this has been known to follow the use of quinine and urea hydrochloride solution elsewhere in the body. In his own experience he has not had the complication follow his treatment. His first experiments were made with a very dilute solution. He now uses a 2.5-per-cent solution without causing tissue death.

The patients first treated acknowledged that they had received instant relief, but that it had lasted for only a few hours, or at most three or four days. After the stronger solutions were used the relief was again instantaneous, but of considerable duration.

Several of the patients came back once or twice to report marked improvement, and stated that they were so well that they "didn't need further treatment." Several allowed themselves to be recystoscoped that the author might observe the results, and in each case the area of injection was plainly discernible for long periods after. The areas where the wheal had been stood out as a pale yellow spot, resembling almost normal bladder wall, surrounded by the diseased, angry looking mucosa. Strange to say, even though the area injected was only a small part of the trigone much relief was experienced. One patient who had had several treatments during which the entire posterior half of the trigone was injected kept herself under observation for about three months. During this time she was perfectly well.

RESECTION OF THE RECTUM FOR CANCER.

LOCKHART-MUMMERY (*Lancet,* Jan. 3, 1920) notes that hitherto operations for the removal of the rectum for cancer have compared unfavorably with such operations as removal of the breast, etc., chiefly because they have been accompanied by a high mortality, or because they were only possible in a small proportion of the cases seeking treatment. The dangers of the operation have been mainly two—shock following a long and serious operation in an elderly patient; and sepsis.

He observes that in 1918, the fourth year in which he had used the technique he has devised, the mortality was *nil,* though the largest number of operations was performed in this year (24).

He reports for the last four years 65 cases; of which 37 were operated upon in

hospital and 28 cases in private homes. Five deaths occurred among the hospital cases and no deaths among the 28 private cases. One patient died of hemophilia; and one of cerebral embolus thirteen days after the operation. In the hemophiliac three weeks were spent in getting his blood-coagulation time up to the normal before attempting the operation. In spite of this it proved fatal. In the three other deaths two were due to sepsis and one to hemorrhage.

Lockhart-Mummery's technique makes it possible to perform an absolutely aseptic operation. Convalescence should and usually does run an aseptic course.

Gas and oxygen are used as the anesthetic; or twilight sleep combined with spinal and local anesthesia. When spinal anesthesia is used great care is taken to see that the patient is kept with the head slightly down from the time that anesthesia begins until all sensation in the legs has returned. As a result of this precaution there has been only one case of slight headache and no other after-effects. Local anesthesia gives equally good results, but is more troublesome. There were 20 patients over sixty years of age and four over seventy.

The operation is performed in two stages as a rule, but this is not essential unless the patient is old or unless some degree of obstruction is present.

The first operation consists of a colotomy performed through the left rectus, fairly high up; this is done under gas and oxygen and local anesthesia. At the same time the opportunity is taken of examining the abdomen for secondary deposits and, if necessary, the upper limits of the growth for adhesions to the bladder, etc. The colotomy is opened two days later, and the lower bowel and rectum are then washed out daily from the lower colotomy opening. In cases in which the growth is small and situated near the anus it is often possible to leave the patient with a sacral anus if there is any special reason for doing so.

The second operation is performed a week or ten days later. The patient is not starved beforehand; he is only deprived of breakfast on the morning of operation. Heroin, or morphia and atropine, are given about three-quarters of an hour before operation unless "twilight sleep" is being used, when scopolamine and morphia are substituted. The operation is performed in the left semiprone position. Before beginning the operation a No. 8 gum elastic catheter is tied into the bladder, if the patient is a man, in order to act as a guide to the urethra during the operation.

The first step in the operation is to pass a stout silk ligature round the anus subcutaneously with a curved needle. This is tied up tightly so as to exclude the anus entirely. After this the skin all round is thoroughly painted with iodine and the towels are put in place. The surgeon does not wash up or put on his gloves until after he has closed the anus. The incision is made starting from the base of the sacrum and carried forward in the midline surrounding the anus, and well clear of it, to meet about 1½ inches in front. This incision is then deepened, cutting well away from the rectum into the fat. The coccyx is disarticulated, or, in case this should not give room enough, some of the sacrum is removed. The deep fascia is opened just in front of the sacrum, and the first finger of the left hand is passed deep to the left levator ani muscle, and the latter cut well away from the rectum with scissors. The same is then done on the right side. The next step is to dissect the rectum away from the prostate or vagina in front. This is easy in the female, but rather difficult in the male. The catheter tied into the urethra is a useful help as it can be felt through the wound, and prevents one from getting in front of the prostate. This part of the dissection must be done boldly with scissors, care being taken not to injure the rectum, as this would involve a septic wound. After the wound in front of the anus has been deepened about two inches the lower edge of the prostate will be reached, and the

rectum will strip easily. The peritoneum will now come into view, and should be opened and cut back along the sides of the rectum. The rectum and growth are now free except above. The mesorectum is now cut through as high up as possible, and the vessels in it caught with forceps and tied off. Only the bowel now remains to be divided. This is done between two clamps with a Paquelin cautery. The stump of the sigmoid in the upper clamp is now invaginated by a catgut Mikulicz stitch, and further protected by a mattress stitch outside this. The peritoneum is next closed by a continuous catgut stitch. The wound is then closed except for a single drainage-tube at the lower angle. Lately the author has discarded the drainage-tube entirely.

The operation has sometimes been performed in thirty-five minutes, and unless special difficulties are encountered it should not take more than forty-five minutes. If in a female the posterior vaginal wall is involved it may be removed together with the rectum.

The patient is generally out of bed in fourteen days, and usually able to return home in three weeks. There is one factor in the after-treatment which is a departure from common practice, namely, that ordinary solid food is given from the start. No alteration in the patient's usual diet is made, and he is given an ordinary meal as soon as he wants it. Beef-tea and milk are strictly forbidden. To insure asepsis of the wound 1:20 carbolic dressings are used and changed twice daily.

The degree of disability is very important to measure accurately. The resulting disability is almost entirely due to the colostomy opening. It is undoubtedly much less than in cases in which a sacral anus has been left, as there is no trouble from prolapse of mucous membrane with a modern colostomy opening.

Out of 17 hospital cases in which it was possible to investigate the disability from a wage-earning point of view, it was found that 12 had returned to work within a year of operation; four had not, and one had been obliged to take a lighter job. Those returning to work included persons in the following occupations: engine-driver on the railway, actor, washerwoman, workshop foreman, drapery assistant, munition worker, physical drill instructor, and stevedore. The disability would appear to be surprisingly little.

SURGICAL TREATMENT OF EXOPHTHALMIC GOITRE.

CRILE (*Surgery, Gynecology and Obstetrics*, January, 1920) bases his conclusions upon a personal experience in 2250 thyroidectomies, of which 1169 were for exophthalmic goitre; among the latter 56 per cent of the cases, or 660, were ligated. No case was rejected for operation unless it was in the state of dissolution. In the last series of 331 thyroidectomies, 116, or 35 per cent, were first ligated, and no case was rejected. Among the 116 ligations there was only one death, a patient in the early stage of dissolution, who was delirious when the ligation was made. The downward course of this case was not arrested.

The series of 1169 thyroidectomies for exophthalmic goitre began with operations under ether alone, and with no special precautions. The mortality rate of these early cases was 16 per cent. After the adoption of anociassociation—nitrous oxide-oxygen and local anesthesia with the anesthetization of the patient in his room—the mortality rate fluctuated between 2 and 5 per cent, until by the adoption of the system of management to be described the mortality rate for all goitres among the last 331 thyroidectomies has dropped to six-tenths of one per cent. This number includes one series of 206 consecutive thyroidectomies without a death, and 182 thyroidectomies for exophthalmic goitre with two deaths—a mortality rate of 1.1 per cent.

By the adoption of nitrous-oxide-oxygen, the use of local anesthesia, the mul-

tiple stage operation, the exclusion of the psychic factor, and the application of the principle of carrying the operation to the patient, it seemed as if there had been included every possible means of safeguarding the patient.

But an occasional case was still lost as a result of postoperative hyperthyroidism. In postoperative hyperthyroidism, the cause of death is excessive chemical activity. Therefore, the urgent need in these cases is a safe means by which this excessive chemical activity may be controlled. It is known that with each degree of rise in temperature, the chemical activity within the organism is increased 10 per cent; that is, if the temperature of a patient has risen to 106°, his metabolism has increased 70 per cent. Conversely, with each degree of fall in temperature, the metabolism will decrease 10 per cent. Once convinced that this physical-chemical principle held true for hyperthyroidism, Crile literally packed these cases in ice and found that this procedure acted almost specifically in controlling the destroying metabolism. The patient is covered with a rubber blanket, surrounded and covered with broken ice, and an electric fan is used to promote evaporation. In one case the postoperative temperature was 106°, the pulse rose to 200; the patient was delirious and dying. He was packed in ice, and in two hours the temperature was reduced to 99.2°, the pulse to 140, and the patient was conscious and on the road to recovery.

In grave risks the principle of the graded operation has been further extended by leaving the wound open and dressing it with 1:5000 flavine, a British war product, which holds the wound *in statu quo* for one, two, or three days, as required, when further operation on the thyroid or closure of the wound is done in the patient's room.

Ligation is always done in the patient's room under nitrous oxide analgesia and local anesthesia. In certain serious cases the lobectomy is done in the patient's room.

It is obvious that the state of the patient supplies the lead throughout; and that complete team-play among the professional, the anesthetic, and the nursing staff is required. Indeed, these operations are not performed by the surgeon but by the hospital.

The following are the principal factors in Crile's system of management:

The differential diagnosis is greatly aided by the Goetsch test and metabolism determinations.

The operative procedures are graded according to the severity of the disease.

The inhalation anesthetic is nitrous-oxide-oxygen, which is administered with the patient in bed; the operation being performed either with the patient in bed or after his transportation, under anesthesia, to the operating-room.

In moderate cases the entire operation may be completed at one séance.

In more severe cases the thyroid activity is diminished by a preliminary ligation with the patient in bed, under nitrous-oxide-oxygen analgesia and local anesthesia.

In extremely grave cases it may be necessary to diminish the thyroid activity by multiple steps—ligation of one vessel; ligation of the second vessel; partial lobectomy; complete lobectomy—allowing intervals of a month or more between these stages, the length of each interval being determined by the degree of physiologic adjustment.

If during the operation the pulse runs up beyond the safety point, the operation is halted, the wound dressed with flavine, and the operation completed after a day or two when conditions have again become safe. In some cases, even though the thyroid has been resected, it is advisable to dress the unsutured wound with flavine and make a delayed suture in bed the following day under analgesia.

In certain cases lobectomy is performed while the patient is in bed and under nitrous oxide analgesic and local anesthesia.

Psychic control of the patient on the part of the surgeon, the interne, the anesthetist, and the nurse is required throughout to diminish the intense drive. An

anociated regimen should be prescribed for the preoperative, interoperative, and postoperative periods. The preoperative and the postoperative management are of almost equal importance to that of the operation itself.

If, after the operation, the temperature becomes excessively high, with greatly increased pulse and respiration, the patient is packed promptly in ice.

To avoid the effects of too sudden a withdrawal of thyroid secretion, thyroid extract is given the night before a lobectomy.

In this paper the author has considered only the immediate surgical management of exophthalmic goitre. It should be noted, however, that the postoperative management of these cases is of equal importance.

Because of the striking benefits which follow the operation, and in view of the fact that a comprehensive surgical control yields a mortality rate of 1.1 per cent and excludes the rejection of any case on account of its gravity, Crile feels that the status of the surgical treatment of exophthalmic goitre is approaching the status of the surgical treatment of acute appendicitis.

EMPYEMA.

MOSCHCOWITZ (*Surgery, Gynecology and Obstetrics*, January, 1920) notes that the formative stage of an empyema begins with the rupture of a subpleural abscess. There ensues promptly a rapid increase of fluid, and the conversion of a serous into a seropurulent exudate. The rapidity of the formation of this exudate, as well as its amount, depends somewhat upon the nature of the infecting organism. In the epidemic caused by the streptococcus hemolyticus, the fluid developed and reaccumulated much more rapidly than in the later influenza epidemic.

During the formative stage the patient is suffering from a number of things, for each of which treatment is indicated.

The toxemia brings in its train a tremendous loss of nitrogen. This observation and its therapeutic importance has been made the subject of an exhaustive study by Captain Richard Bell, of the empyema commission. To replace this loss, the patient must be fed on a diet rich in calories. Clinical observations have corroborated the great value of this measure.

The presence of fluid in the pleura from its mechanical effects may be deleterious for three reasons: first, from compression of the affected lung; second, by pressure upon the mediastinum, and compression of the unaffected lung; and third, and most of all, by pressure upon the heart, and consequent kinking of the great vessels. It is for this reason that left-sided exudates are borne less well than those on the right.

To relieve these mechanical effects of large exudates, Moschcowitz resorted to the simple device of aspiration with an apparatus that does not permit the entrance of air.

It was truly remarkable to witness the almost immediate benefits of this measure. The patients were more comfortable, the dyspnea was less, the cyanosis was not so marked, and the pulse improved in quality. Aspiration was repeated as often as the fluid reaccumulated in amounts sufficient to demand it; in some instances, especially in the streptococcic form, as often as every twelve hours. In a few instances aspirations were even curative.

Early thoracotomies are attended by a terrible mortality, as the statistics in our military camps during the epidemic of 1917 and 1918 woefully testified. Early operations were probably prompted by the enthusiasm of both internists and surgeons, who for the first time saw empyemata in large numbers develop under their very eye, and felt that early operation, which in other suppurative surgical affections is a great desideratum, would give similarly brilliant results. It was only when frightened by the formidable mortality that a halt was called on early operations, and the

statistics improved. The patients died not only in large numbers, but promptly after the operation. When we consider that these operations were done upon patients who at the same time were sick unto death with an active pneumonia, it is not surprising that the mortality was so large.

Another but less important contraindication to early operation is the fact that even if the patient survives the lung becomes fixed in its collapsed position by adhesions, so that a huge empyema cavity results which takes an interminable time to heal.

To sum up, the treatment of empyema in the formative stage resolves itself to the formula *nil nocere*. The only surgical procedure indicated is aspiration of the chest.

When the seropurulent fluid changes into pus, adhesions form between opposing surfaces of the pleura. These adhesions are important because they anchor the lung to the parietes. The thorax therefore can now be opened without causing collapse of the lung. The author states that he is speaking now only of the commonest form of empyemas, namely, those situated in the supradiaphragmatic and posterior portion of the chest. Slight variations obviously occur in empyemata in other situations, but the underlying principles remain the same.

Furthermore, the patient at this time is in a much improved general condition; the pneumonia is over, and the general toxemia has subsided. There is nothing to contend with now but the empyema, which causes symptoms from absorption of toxic material and from the mechanical effects of the fluid.

The operation of thoracotomy for empyema is extremely safe. It consists simply in evacuating an encapsulated abscess lined by a thick pyogenic membrane.

If there is a communication of the abscess with a bronchus of larger size, we obtain a not infrequent complication known as "pleuropulmonary" fistula. In the presence of this lesion distention of the cavity with large quantities of Dakin's solution causes a very distressing cough and choking sensation. However, they tolerate the instillation of smaller amounts with perfect comfort; more particularly if attention is paid to the posture of the patient while the fluid is instilled. A position will nearly always be found in which the instillations do not cause distress.

In rare instances the fistula is of unusual size, varying in diameter from that of a pencil to a little finger.

Finally it may happen in some cases of empyema, particularly those that have drained for a long time, that the lung has expanded until it fills the entire pleural cavity. In such instances the opening into the lung may become adherent to the drainage opening. There is thus formed a short channel, leading directly from the skin into a bronchus. On coughing, air and a slight amount of bronchial secretion are expressed. A sinus of this description should be called a "bronchocutaneous fistula." They are exceedingly difficult, if not impossible, to cure without operation, because the bronchial and cutaneous epithelium become continuous and form a so-called "lip fistula."

Satisfactory results are obtained by mobilizing the lung and excising the sinus, thereby converting the bronchocutaneous fistula into a pleuropulmonary fistula. The subsequent healing is not as a rule protracted. An inversion suture of the fistulous opening in the lung may shorten the period of healing.

If we analyze the physical forces which enter into the healing of an empyema, we will find that they are composed of a number of factors, all of which tend to diminish the thoracic cavity. They are: first, the diaphragm ascends; second, the direction of the ribs becomes more vertical; third, the intercostal spaces become narrower; and fourth, the arc of the ribs approaches closer to the median line. At the same time the lung expands until the parietal and visceral pleura become adherent. It is only when this stage has been reached that we can speak with any degree

of certainty about a cure; whenever a space is left there is always the possibility of a recurrence. Broadly speaking, therefore, these reaccumulations are always a reflection upon the treatment, for they usually mean that drainage and antiseptic treatment of the cavity have been discontinued prematurely.

The diagnosis of recurrent empyema is difficult if the signs and symptoms are not marked. Examinations with the *x*-ray, especially stereoscopically, are of prime help.

The treatment of recurrent empyema differs in no way from that of ordinary empyema. Owing to the narrowing of the intercostal spaces it is usually preferable to resect a rib.

The author summarizes his conclusions as follows:

Empyema in most instances results from the rupture of a small subpleural pulmonary abscess.

An empyema is the final stage of a process, in which the first stage is a serous pleurisy, and the second a seropurulent pleurisy. The latter is the so-called "formative" stage of an empyema.

The "formative" stage of an empyema is unaccompanied by recent pleural adhesions.

The stage of "acute" empyema is always accompanied by adhesions.

The vast majority of empyema are of the encapsulated variety. Very few occupy the entire pleural space.

The treatment of empyema should be begun in the formative stage before the exudate has been converted into frank pus.

It is unwise to perform an operation in the formative stage. The mortality is terrific, because the accompanying pneumonia is still in full bloom, and furthermore, because of the absence of adhesions there occurs an acute pneumothorax with "fluttering of the mediastinum," and consequent embarrassment of the action of the heart.

The best surgical procedure in the formative stage is repeated aspirations done as often as is indicated, in order to relieve the embarrassment due to mechanical pressure of the rapidly accumulating fluid. In a few cases this measure is even curative.

Feeding with a diet rich in calories is an important adjuvant in the treatment of the formative stage.

The treatment in the acute stage of empyema consists in simple intercostal thoracotomy. This operation need not be considered an urgent one, and should be performed when the patient's condition is otherwise perfectly satisfactory. This is the so-called "late" operation.

Urgent thoracotomy is indicated only in acute pyopneumothorax.

The Carrel-Dakin treatment has proved of superlative value in the postoperative treatment of empyema, and should be instituted in every case. There are no contraindications to its use.

The mortality of acute empyema by these methods is lower than that reported by other methods of treatment.

Empyema cavities heal by three methods:

(*a*) By the formation and absorption of a sterile exudate.

(*b*) By the formation and "absorption" of a closed pneumothorax.

(*c*) By the "classical" method—*i.e.*, expansion of the lung and obliteration of the pleural cavity.

Chronic empyema should not occur, or should at least become very rare, if the methods of treatment of acute empyema as formulated above are practiced.

"Chronic" cases may, therefore, be defined as empyemata which are not amenable to treatment with Carrel-Dakin.

Recurrences in empyema are usually the result of undue haste in closing the thoracotomy opening. The percentage of recurrences is less after the Carrel-Dakin method of treatment than after any other.

The vast majority of operations that have been devised for chronic empyema will have a very limited field of usefulness, if the methods of treatment advocated above are carried out.

REVIEWS.

THE DISEASES OF INFANTS AND CHILDREN. By J. P. Crozer Griffith, M.D., Ph.D. Copiously illustrated. Volumes I and II. W. B. Saunders Company, Philadelphia, 1919. Price $16.

No work, except those of an encyclopedic character, dealing with children's diseases and published in America has approached this one in size since the appearance many years ago of the celebrated book upon Pediatrics by Meigs and Pepper.

The first volume of this work covers nearly 900 pages and the second volume 657 pages. Dr. Griffith has been for the last twenty-nine years the Clinical Professor of Diseases of Children in the Medical Department of the University of Pennsylvania, and he states in his preface that it has been his effort to present a review of the subject of medical pediatrics as completely as possible without attempting to make his work encyclopedic. He has included such subjects in surgery and the special branches which physicians treating diseases of children should be more or less familiar with. He has also endeavored to imprint upon the text the results of his personal experience, but he freely admits that he has used numerous excellent textbooks in this country and abroad to aid him in his work.

The first volume naturally deals with the anatomy and physiology of early life, hygiene and feeding, symptomatology and diagnosis, mortality and morbidity, and its first division ends with a chapter of somewhat over 30 pages upon the therapeutics of early life which we think our readers will find of practical advantage.

The second division of the book deals with the various diseases of the new-born, then with the acute infectious diseases and the nutritional diseases, including those of the digestive system.

The book is copiously illustrated, as we have already stated, and a large number of bibliographical references which the author considers of importance are found as footnotes on numerous pages. The colored illustrations are particularly good, as, for example, those showing a stool containing proteid curds, another the soap stool, and, third, the so-called curdy stool made up of white masses with mucus of a pale, brownish tint forming quite a contrast. There is still another plate which is called the carbohydrate stool, and which is more normal in appearance. Finally there is a plate showing the spinach-green stool slightly blood-stained and containing a large amount of mucus. These plates are remarkably true to nature.

In the second volume the author deals with diseases of the respiratory and circulatory systems, genito-urinary and nervous systems, diseases of the muscles, bones and joints and of the blood and blood-making organisms, and then with diseases of the ductless glands and internal secretion. In the last section there are chapters upon diseases of the skin, eye and ear, all the latter being covered in a space of 59 pages. In this volume again we find a number of excellent colored plates, which, however, are pathological rather than clinical, as, for example, one showing plastic pleurisy with pneumonia and another showing a brain covered with lymph due to a pneumococcic meningitis. A very large number of black-and-white illustrations are taken from patients under Dr. Griffith's own care.

The worst illustration is the one entitled "Cachectic Purpura," which is not only indistinct but which is so placed that it is difficult to tell at first glance what part of the body is shown.

These handsome volumes are very evidently the result of many years' labor, the author constantly bearing in mind from year to year that his ultimate aim was to produce an exhaustive consideration of the subject for which he has during these years faithfully collected valuable material.

THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY. Tenth edition, revised and enlarged. Edited by W. A. Newman Dorland, M.D. Illustrated. W. B. Saunders Company, Philadelphia, 1919. Flexible leather $6, with thumb index $6.50.

Dorland's Medical Dictionary is so well known to the medical profession that little more is necessary than to call attention to the fact that the tenth edition has been required. It is a volume to which we constantly refer. The fact that ten editions have appeared in nineteen years is a tribute to its excellence.

One of the characteristics of the book is that in many instances the name of the originator or discoverer of a thing or process, with his date of birth and death, is given, and for this valuable feature the editor is indebted to Dr. Garrison, the well-known medical historian.

As the book has been reprinted many times as well as republished in new editions an immense number of copies must have been distributed amongst medical men. It is a complete dictionary of the terms used in medicine, surgery, dentistry, pharmacy, chemistry, veterinary medicine, nursing, biology and kindred branches, and contains many new and elaborate tables which are valuable for reference. The book can be most highly recommended to those who are desirous of possessing a first-rate medical dictionary.

A LABORATORY MANUAL OF PHYSIOLOGICAL CHEMISTRY. By Elbert W. Rockwood, M.D., Ph.D. Fourth edition, revised and enlarged. Illustrated. The F. A. Davis Company, Philadelphia, 1919. Price $2.

Dr. Rockwood's Manual is fortunate enough to have reached the fourth edition in a period of twenty years. The present edition is illustrated with one colored plate, three plates of microscopic preparations, and seventeen engravings. The book has been prepared by him as Professor of Chemistry and Toxicology in the University of Iowa, and he is the author of An Introduction to Chemical Analysis for Students of Medicine, Pharmacy and Dentistry. In his preface he points out that too complete a guide in physiological chemistry is usually an embarrassment to the student, and those of our readers who are familiar with the more recent works upon this subject will feel that his attitude in this respect is correct, so far as students are concerned. For the reason given he has made no attempt to make his book all-inclusive or encyclopedic in nature.

In the next edition we think that the author can make an improvement by adding at the end of the various analytical methods described, a short paragraph giving information as to the normal quantity of the substances determined; thus in the description of the non-protein nitrogen test it would be very simple to add a statement as to what is normal and what is abnormal.

THE PRINCIPLES AND PRACTICE OF PHYSICAL DIAGNOSIS. By John C. DaCosta, Jr. Fourth edition, revised. W. B. Saunders Company, Philadelphia, 1919. Price $4.75.

Four editions and several reprintings of this book have appeared since 1908. The new matter in the present edition deals with Gas Edema, Gas Pneumonia, Influenzal Pneumonia, and Hilus Tuberculosis. Additional subjects are The Effort Syndrome and The Aviation Heart. Great attention has also been called to the chapters on The Use of the Sphygmomanometer, Intradural Pressure, and as to the Estimation of the Cardiac Reserve Force.

The volume is somewhat larger than its predecessors, is excellently printed and well illustrated.

A LABORATORY MANUAL OF PHARMACOLOGY, INCLUDING MATERIA MEDICA, PHARMACOPÆDICS, AND PHARMACODYNAMICS. By A. D. Brush, B.S., M.D. Illustrated in black and white and colors. The F. A. Davis Company, Philadelphia, 1919. Price $3.50.

This is a book which, as its title indicates, does not deal with therapeutics at the bedside, but with a study of crude remedies, tests which are made to determine their character and purity, and contains in colored plates and black-and-white pictures representations of the drugs as they grow in the soils which are favorable.

The colored plates are excellent. The black-and-white illustrations showing the crude drug in the process of growth are, some of them, not particularly distinctive, as, for example, that showing stramonium plants and fruit. The part of the book which is devoted to pharmacology describes briefly the physiological action of a number of the more important drugs in the space of about sixty pages, with large diagrams designed to illustrate the portions of the nervous and circulatory systems upon which these substances exercise their dominant influence.

Without doubt the student who pursues the course laid down in this manual will obtain much that is excellent in the way of truth. It is not, however, a volume which will prove useful to the graduate in medicine.

CORRESPONDENCE.

MATERNAL IMPRESSION OR A REMARKABLE COINCIDENCE.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: The literature of a few years ago contained many allusions to the subject of the effect of maternal impressions upon the unborn child. After a search of recent literature apparently the majority of obstetricians consider the theory exploded.

The following case is, however, interesting, as the facts are entirely accurate, all having been collected by myself, none being hearsay. You may be sure that the people involved in this case would not accept any such explanation as coincidence.

Mrs. H., aged thirty-one. Family history, negative. No previous serious illness; has always been a healthy woman. Menstruation established at fourteen years. Has been regular with no dysmenorrhea. Married twelve years. Miscarriage of four months, in January, 1908. Examined November 2, 1918, apparently in the sixth or seventh month of pregnancy. Pelvic measurements, Sp. 26, Cr. 29, Tr. 32, Ext. Con. 20. Blood-pressure, 120-80. Menstruated May to July, very slight; missed August and September. Slight menstruation in October.

At this examination on November 2, 1918, the patient explained to me she attended the Churchill Downs races at Louisville on May 16, 1918, and saw "Red Cross" fall, break his right leg, and was shot. This worried her very much as she was a great admirer of fine horses.

On June 30, 1918, she saw her pet cat run over by a street-car. The patient saw the cat's viscera, which were exposed after its death.

August 30, 1918, she saw a man delivering coal at her house. There was a deformity of the nose caused, as she said, by a disease having eaten it off. At this time, three months before delivery, she said she felt sure her baby would be deformed in the manner above described. She stated that each incident was such a shock to her that her baby could not help but be marked. Each time she came to the office she mentioned it.

During the entire period of labor the patient begged me many times to promise her that I would see that the baby should not live, as she knew it was deformed.

The position of fetus was occiput right posterior, and delivery was accomplished after eleven hours without any assistance on my part. The head was small, and progress being good, I permitted it to deliver as O. R. P.

The babe exhibited a complete evisceration of the entire abdominal contents through the right abdominal wall. The nose was extremely flattened (probably due to pressure on symphysis). Right thigh and leg deformed and atrophied; right foot, apparently normal; left thigh and leg, normal but with a deformed and atrophied foot.

Yours truly,

E. H. RYAN, M. D.

COLUMBUS, OHIO.